Port McNeill Forest District

Resource Management Plan
2000-2001

SUSTAINABLE HARVEST

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Introduction

The mandate of Forest Renewal BC is to plan and implement a program of investment to renew the forest economy of British Columbia by enhancing the productive capacity and environmental values of forest lands, and by creating jobs, providing training for forest workers, and strengthening local communities that depend on the forest industry.[1]

The purpose and functions of the Ministry of Forests are, among other, to encourage maximum productivity of the forest and range resources in the province; manage, protect and conserve the forest and range resources of the Crown while having regard to the immediate and long term economic and social benefits they may confer on the province. The Ministry is also charged with planning the use of forest and range resources of the Crown, so that the production of timber and forage, the harvesting of timber, grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values and coordinated and integrated, in consultation and cooperation with other ministries and agencies of the Crown and the private sector.[2]

In 1997/98, the Board of Directors of Forest Renewal BC refined the Strategic Plan. The new direction provided by the strategic objectives required that each of the six regions of Forest Renewal BC develop their own specific regional plans. The plans addressed the uniqueness of each region as they were defined in the new Land-Based Delivery System and the regional advisory processes.[1]

The major change in the new land-base delivery system was a shift from proposal driven delivery system to an allocation-based system of funding. The primary role for the Ministry of Forests in the new delivery model was to maintain stewardship and statutory functions and undertake a reduced lead proponent role. In order for the Ministry of Forests to provide resource stewardship input, it was formally recognized within the Multi-Year Services Agreement between Forest Renewal BC and the Ministry of Forests that Resource Management Plans would be prepared annually for each Planning Unit (generally a forest district).

Resource Management Plans are intended to establish resource objectives and resource priorities, identify resource investment opportunities by activity and anticipated resource outputs, as well as any critical work to be done in the next fiscal year. This Resource Management Plan represents the sustainable harvest component for the Port McNeill Forest District planning unit.

Background

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[1] Forest Renewal BC Pacific Regional Plan, 1998
[2] Ministry of Forests Act, Section 4, 1979

The Port McNeill Forest District covers an area of approximately 1.8 million hectares with an annual harvest of just over 5 million cubic meters of wood. The Port McNeill Forest District has six Tree Farm Licenses (TFL) and one Timber Supply Area (TSA). For resource planning purposes the district was divided into logical management units following the boundaries of Tree Farm Licenses and the Kingcome Timber Supply Area.

Management Unit Summary Port McNeill District

Management Unit - Tenure	Licensee
TFL 37	Canadian Forest Products Ltd.
TFL 45	International Forest Products Limited
TFL 39	MacMillan Bloedel Limited.
TFL 47	TFL Forest Ltd.
TFL 6	Western Forest Products Limited
TSA - Kingcome	Various Licensees

Resource Management Planning

An incremental silviculture strategy was developed for the Kingcome TSA using the Ministry of Forests, "Guidance Towards Participation in the Forest Renewal Planning Process and the Development of Resource Management Plans" as well as, "Resource Management Plan - Guidelines for the Sustainable Harvest Component of Resource Management Plans". All TFL Licensees also followed this guidance.

The Incremental Silviculture Strategies for all Management Units were summarized to show all goals and funding required for each activity by program for the five year planning period as seen in Table 1. Despite the ranking within each management unit, the Port McNeill Forest District continues to overall rank activities for the planning unit as follows:

Rank#
1. Backlog NSR
2. Conifer Release/Brushing
3. Fertilization
4. Expanding the Timber Harvesting Landbase
5. Juvenile Spacing
6. Pruning

Choosing to fund activities in this order will have the greatest timber supply benefits overall for the planning unit.

Incremental Silviculture Strategies (Summary)

The following is a summary of the Incremental Silviculture Strategy for each Management Unit:

TSA - Kingcome

STRATEGY AT A GLANCE

Working Targets

The Kingcome TSA has limited ability to overcome forecast reductions in both timber quantity and quality.

Quantity: Maintain short term harvests at near-current levels (TSR 1 AAC of approx. 1.4 million m^3/yr) for as long as possible. Manage mid-term timber supplies to yield a harvest of approximately 1.0 million m^3/yr and long term supplies to yield 1.3 million m^3/yr.

Quality: Manage regenerated stands to yield at least 4% premium logs by volume, with the majority of the remainder being of sawlog quality.

Product Objectives

The following are product objectives at the log level for the Kingcome TSA.

Premium Log:

Hemlock..... 60+ cm DBH, clear, min 5 m log, not less than 3-4 rings/cm on M/P sites and 2-3 rings/cm on G sites.

Cedar pole . 45+ cm min DBH, min 20 m log, low taper, min 20 cm top.

Balsam..... 60+ cm DBH, clear, min 5 m log.

Sawlog: Minimum average stand DBH of 45 cm and min. stand vol. of 350 m^3/ha.

Major Silvicultural Strategies

Quantity

(Some of the following are not within the traditional scope of incremental silviculture but are included here for completeness.)

1. Increase regenerated stand yields 20%, and achieve green-up 3 years earlier by:
   - reducing time to regeneration by 2 years by planting all areas;
   - using (2^{nd} gen) A class seed or better (requires tree improvement for Balsam);
   - using large planting stock, and/or individual tree fertilizing at planting, and/or seedling protection;
   - brushing for growth enhancement; and
   - fertilizing 500 ha/yr of cedar-salal sites to achieve early crown closure.
2. Implement partial harvesting regimes in VQ zones.
3. Expand the timber harvesting land base by:

- rehabilitating the remaining 300 ha of backlog NSR and brushing (conifer release) 3000 ha of backlog plantations;
- draining low-site wet lands (10 ha trial); and
- assessing opportunities for rehabilitating non-commercial alder stands back into conifer production.

Quality

1. One-lift prune (3.5 m) 100 ha/yr.
2. Manage selected stands to higher densities to yield pole-sized trees.
3. Space 100 ha/yr to increase avg. piece sizes and prepare stands for pruning and commercial thinning.

TFL 37 - Canadian Forest Products Ltd.

The following information is summarized from Canadian Forest Products' TFL 37 Management Plan 8 and is intended to supplement the licensees Resource Management Plan attached in Appendix II.

Basic Data

Canadian Forest Products' TFL represents the southern most portion of the Port McNeill Forest District. It encompasses 188,745 hectares of which 54 percent are considered within the net operable landbase for the long term. The Allowable Annual Cut (AAC) is 1,068,000 m^3 making it the second largest cut on the north island.

Management Issues

The key issues affecting timber supply from a timber quantity, quality and forest health perspective are addressed in detail within the appended Timber Supply Analysis. The MOF base case scenario indicates a reduction in annual harvest to 1,034,200 m^3 in year 21. Harvest remains at this level until 121 years when AAC is forecast to increase to 1,172,100 m^3. Key factors influencing short term harvest levels are:

- The amount of mature timber on the TFL.
- The timing of the availability of managed stands for harvest.
- Green-up requirements tying up adjacent timber

The sensitivity analyses and accompanying tables and figures are in Appendix Ii.

Resource Objectives

Timber

Management Plan 8 specifies attributes of future managed stands. This includes log grades, (premium, standard, gang and utility) target and minimum stand volumes and piece sizes. Target stand attributes were constructed for each BEC site series on the TFL.

Habitat

Opportunities exist to improve habitat quality in riparian zones and ungulate winter range areas. Juvenile spacing promotes increased growth in streamside conifers which will allow faster recruitment of desired streamside habitat characteristics such as stable banks, provision for shade and large organic debris. Spacing and pruning regimes have been shown to increase forage availability in ungulate habitats. The Vancouver Island Land Use Plan has identified high priority areas for such treatments in the Tsitika/Woss Special Management Zone.

Opportunities to Increase Timber Supply

Enhanced forestry activities contribute significantly to increasing timber quantity, in particular fertilization and tree improvement. Long term research results indicate that multiple fertilization treatments result in significant increases in merchantable volume over a rotation. Weetman et al (1997) report that Fd stands fertilized on 8 year intervals over an 80 year rotation will yield a 13 percent increase in merchantable volume and will provide a 7 percent return on invested funds.
Based on these results, multiple treatments of urea on Fd leading stands is proposed as a high priority throughout the specified planning horizon. One can see the implications of enhanced forestry work on timber supply within the detailed strategy section of TFL 37. Clearly there is a benefit in the medium term and dramatic increase in the long term.

Although not depicted in Appendix II because of its low chances of approval, Canadian Forest Products believes the greatest influence Forest Renewal BC can have on increasing timber supply is by funding "Incremental to Basic" activities. Funding is meant to supplement existing money currently being spent by licensees to get stands to free growing status. Improving stock that is going into the ground, fertilizing, fill planting etc. In the event Forest Renewal BC changes policy and allows incremental to basic activities to be funded, Canadian Forest Products request that consideration be given to their proposal.

Opportunities to Improve Timber Quality

Canadian Forest Products has always recognized the importance of enhanced forestry in achieving quality. Pruning produces a bole of a specified length free from knots. Spacing criteria allows deformed trees poor in form and growth to be selected out early in the rotation. While these treatments will increase the proportion of higher quality sawlogs, it is uncertain whether the returns will justify investment levels.

Critical Projects

Critical projects include those that ensure the continued success of First Nations Partnerships and the North Island Community Forestry Program. Activities will include juvenile spacing and pruning for habitat enhancement and timber quality improvement.

Incremental Silviculture Program

The Silviculture program is outlined in the attached tables found within Appendix II. Priority works include fertilization, backlog surveys and treatments and habitat restoration. Canadian Forest Products has maintained a high level of enhanced forestry activities in the past and they wish to continue that trend into the next five year planning period.

TFL 45 - International Forest Products Limited

Basic Data

The Port McNeill Forest district portion of Tree Farm License 45 is located on the lower valley of the Klinaklini River basin as well as several side valleys off the northern section of Knight Inlet. The net forested land base area of the TFL is 29,131 hectares, which supports an AAC of 210,000 cubic meters.

Resource Objectives

The primary goal of the incremental silviculture program is to enhance future harvest opportunities with increased saw-log volume recovery. Forest management activities that will be considered are those that are expected to yield greater volumes of wood with better grades and higher value. Maximize H and I grade saw-logs, or better, suitable for the manufacture of clear appearance, select structural lumber are produced with 50 cm +- 15 cm average DBH for final harvest and 30 cm +-5 cm for commercial thinning.

Opportunities to Increase Timber Supply

Sensitivity analysis show that the timber supply for TFL 45 may be increase by 3 percent if the green up ages could be reduced by 2 years. Four percent gain could be realized if rotation ages could be reduced by 10 years. Fertilization is the single treatment that is likely to meet the above mentioned gains. Site preparation could also have direct positive timber supply gains by adding area to the net operable landbase.

Opportunities to Improve Timber Quality

Interfor's goal is to produce stands that will maximize H and I grade logs, with emphasis on clear wood products. This will best be achieved by juvenile spacing and pruning select stands to ensure achievement of these products.

Critical Projects

Backlog brushing should be considered as critical projects for all years. Failure to carry out treatment may results in slower tree growth and in some cases result in conifer mortality.

Incremental Silviculture Program

The Incremental Silviculture Program is summarized in Table 5 of Appendix III. Although most work has already been accomplished, Interfor is proposing a balanced approach distributing funds between fertilization, pruning, spacing, brushing, site preparation and planting.

TFL 39 - MacMillan Bloedel Limited

Basic Data

Basic data on area, harvest levels, and age class distributions are found in Management Plan #7 for TFL 39. Block 3 is located on the islands and mainland areas near Port McNeill, and block 4 is in the Benson River drainage. The timber harvesting land base for the two blocks is 49,666 hectares, and the AAC is 415,000 cubic meters.

Management Issues

The key issues affecting timber supply from a timber quantity, quality and forest health perspective are addressed in section 2.0 of the Management Plan. Issues include landbase changes, set asides for alternative uses, constraints on harvesting to achieve non-timber management goals, inventory and growth rate assumptions and the intensity of silviculture treatment.

Resource Objectives

MacMillan Bloedel's general management objective is to maximize the net present value of the prospective stream of earnings from the whole forest. This is achieved by growing the maximum economic volume of timber at an acceptable cost.

Opportunities to Increase Timber Supply

Silviculture strategies for meeting the volume objectives in the longer term include achieving well stocked stands, planting seedlings grown from improved seed, fertilizing pre and post free growing areas, brushing and weeding, reforestation of backlog areas, rehabilitation of poorly performing stands and improved utilization of deciduous areas. Spacing and pruning will be gradually phased out, although some will still occur, generally for non-timber benefits..

Critical Projects

There are no "critical" resource management projects identified for the next fiscal year within the incremental silviculture strategy.

Incremental Silviculture Program

The silviculture program is outlined in the Table 6, appendix IV. In general, the program reflects the need for a lot of backlog surveys and brushing, plus a variety of incremental activities including juvenile spacing, pruning and fertilization. Refer to Table 6 within Appendix IV for more information.

TFL 47 - TFL Forest Ltd.

The following information was summarized from TFL Forest Ltd.'s TFL 47 Management Plan No 2. The priorities, ranking, and rationale for the activities are different from those of the TSA, largely because of the different issues faced by TFL 47 versus the TSA.

Basic Data

TFL Forest Ltd. is a forest company which operates exclusively in the lumber and logging sector of British Columbia's forest industry. The following information relates to the Bonanza Lake Management Unit.

Block 17 of TFL 47 is located on Vancouver Island north of the Johnstone Strait management unit in the Bonanza Lake drainage. It has an area of approximately 38,000 hectares, but after net downs, the total long term harvestable timber base is approximately 23,000 hectares, with an AAC of 200,000 cubic meters.

Management Issues

The key issues affecting timber supply from a timber quantity, quality and forest health perspective are addressed in the appended Timber Supply Analysis. Issues include the impending fall-down in harvest levels in the short and mid-term, a possible increase in the hemlock component of the species composition, harvest age at culmination of Mean Annual Increment (MAI) versus the shorter first entry age, harvest queuing order based on age, accuracy of site index estimates and managed stand yield curves, and the direct impact on the harvesting landbase from biodiversity requirements. The sensitivity analysis and accompanying tables and figures are in the appended Timber Supply Analysis. Incremental silviculture does not play a significant role in managing habitat supply at this time.

Resource Objectives

TFL Forest Ltd. has a strategy to create stands which are predominately small diameter trees with small knots, for sawlog and fiber purposes. Premium logs will continue to come from existing old growth and deferred areas, or areas managed on a long rotation for a variety of reasons.

Opportunities to Increase Timber Supply

Recently there has been considerable debate on the benefits of spacing, including data from some second growth managed stands indicating a decline in volume and a reduction in log quality over natural stands, in some instances.

The current plan is to reduce spacing to a level somewhat below the historic average, to control stocking, maintain or improve growth, or achieve other resource management objectives, such as wildlife forage improvement, market-driven piece sizes, and earlier stand entries. If government funding is available for employment and community stability purposes, TFL Forest Ltd. will consider undertaking spacing projects provided that such treatments do not adversely affect the future value of treated stands.

Fertilization of hemlock remains a dubious venture, and suitable sites are lacking in the Bonanza management unit, with the exception of some pre-free growing areas, currently not eligible for Forest Renewal BC funding. These would be the top priority treatment if funding was provided. Very minor amounts of pruning have also been carried out in recent years, employing students through the Community Forestry

Program. Brushing was limited to 46 hectares in 1986, 12 hectares in 1989, and 2 hectares in 1997

Opportunities to Improve Timber Quality

Market research at TFL Forest Ltd. suggests that the greatest value comes from differentiating the products, not the resource. Consequently, the emphasis of TFL Forest's stand management regimes is on maximizing volume on stems 20 to 50 cm in diameter of good form (e.g. straight boles with minimal taper and small branches). This can be achieved by ensuring excellence in basic forestry practices such as rapid reforestation with a suitable number of seedlings of the most suitable tree species and the best genetic stock and configuration available, and by careful attention to brushing and weeding requirements.

Critical Projects

There are no "critical" resource management projects identified for the next fiscal year within the incremental silviculture strategy.

Incremental Silviculture Program

The Silviculture program is outlined in the Table 7 of Appendix V. In general, there is very little need for backlog activities within TFL 47. Incremental activities focus on surveys and approximately 70 hectares of juvenile spacing per year. No other activities are specifically planned at this time.

TFL 6 - Western Forest Products Limited

The following information is summarized from Western Forest Products Limited TFL 6 Management Working Plan #9 and is intended to supplement the licensees Resource Management Plan attached to Appendix VI.

Basic Data

At 1,288,000 cubic meters Western Forest Products Limited has the largest AAC within the Port McNeill Forest District. Located along the coast of British Columbia, TFL 6 encompasses 170,216 hectares of which 83 percent contributes towards the long term harvestable land base. The operable land base is made up of 77 percent Hw/Ba stands, 17 percent Cw/Yc stands, 5 percent Ss and 1 percent other.

Management Issues

The key issues affecting timber supply from a timber quantity, quality and forest health perspective are addressed within the appended Timber Supply Analysis. Yields are forecasted to decline over the next 50 years to a sustainable level of slightly less than 1,000,000 cubic meters. A few of the issues that are causing this decrease in AAC are;

- Green-up requirements tying up adjacent timber
- Visual Quality Objectives limiting modification of landscapes next to travel corridors
- Disease within old growth stands
- A lack of age classes between 40 years 250 years of age

The sensitivity analysis and accompanying tables and figures are in Appendix VI.

Resource Objectives

Management Working Plan #9 states that sawlogs and pulpwood are two primary objectives when managing for timber. Approximately 50 years from present the AAC will begin to use second growth timber as a major portion of its cut. Currently, the TFL is actively spacing and pruning stands to bring them within operability limits sooner. It is expected that this will help alleviate the AAC downfall in the midterm.

Opportunities to Increase Timber Supply

An aggressive backlog program is being managed on TFL 6. Western Forest Product is making every possible effort to release suppressed conifers and bring Not Satisfactorily Restocked (NSR) areas back into productive conifer stands.

Enhanced Forestry activities contribute significantly to increasing timber quantity, in particular fertilizing that is shown within Management Working Plan #9. Salal ecosystems offer major reforestation concerns. Fertilization encourages crown closure, thus shading out salal and freeing up nutrients that would otherwise be tied up in salal. Salal Cedar Hemlock Integrated Research Program (SCHIRP) trials have shown that

once crown closure occurs, site productivity can be reclassified from poor to medium which translates into a 50 percent increase in MAI. This has significant implications on timber supply. Another enhanced activity that may have AAC implications is a proposed trial of 20 hectares per year of bog land draining. Spacing and pruning have been shown to bring stands within merchantability limits sooner and still maintain wood quality. Through modeling, it has been shown that spacing decreases volumes by 2 percent, but the shortened rotation length will help counter balance the expected decreases in AAC over the next five decades.

Western Forest Products view incremental to basic opportunity as having the largest immediate impact on timber volume. Fertilizing stands that have not achieved green-up will reduce spatial harvesting constraints. Many blocks are currently denied harvest because adjacent stands are within highly visible landscapes and are not greened-up. In addition to fertilizing, Western Forest Products proposes many activities that are deemed beneficial to appraisal ground but that are not currently eligible for Forest Renewal BC funding. These treatments have the potential to increase stand yields and free-up constrained areas sooner.

Opportunities to Improve Timber Quality

Western Forest Products has always recognized the importance of enhanced forestry in achieving quality. Pruning produces a bole of a specified length free from knots. Spacing criteria allows deformed trees poor in form and growth to be selected out early in the rotation. By improving planting stock under the incremental basic program further benefits in quality could be attained.

Critical Projects

Within Western Forest Product's TFLs, the licensee views backlog activities as being critical projects. Approximately 500 hectares of brushing can be sustained annually on the TFLs.

Incremental Silviculture Program

Silviculture programs are outlined in the Table 8 within Appendix VI. Western Forest Products emphasizes that the incremental to basic activities be given the highest rating should they become eligible for funding. This is followed by the backlog program and lastly all enhanced forestry work (with the exception of fertilizing which can be given higher priority seeing that it greatly effects timber volume). Western Forest Products has maintained a high level of enhanced forestry activities in the past and they wish to continue that trend into the next five year period.

Kingcome Timber Supply Area

Incremental Silviculture Strategy (Detailed)
- Version 1.1 –
British Columbia
Ministry of Forests

Funded by :
Forest Renewal British Columbia

Incremental Silviculture Program (ha)

Year	Surveys	Backlog Prep/Plant	Backlog Brushing	Space	Prune - 1	Prune - 2	Fertilize	Drain	Total
1	2,900	200	500	100	100	75	500		4,375
2	2,850	150	500	100	100	0	500	10	4,210
3	2,700	0	500	100	100	-	500		3,900
4	2,700	0	500	100	100	-	500		3,900
5	2,700	-	500	100	100	-	500		3,900
Subtot Yr 1 - 5	13,850	350	2,500	500	500	75	2,500	10	20,285
6 - 10	14,500	-	500	500	500	-	2,500	-	18,500
Total Yr 1 - 10	28350	350	3,000	1000	1,000	75	5,000	10	38,785

Introduction

About the Interim Strategy

The terms of a service agreement between Forest Renewal BC and the BC Ministry of Forests (MOF) require the MOF to develop, and Forest Renewal BC to fund, what is essentially an incremental silviculture strategy. This document is in fulfilment of this contractual requirement.

Incremental silviculture is part of a suite of strategies which together may influence the future quality and quantity of habitat and timber supply. This strategy document broadly analyzes the full range of potential silviculture activities in order to create a context for an incremental silviculture strategy.

An incremental silviculture strategy should not be confused with the allowable annual cut (AAC) determination process. AAC's are based on actual practice and current information at the time of the determination. This strategy, on the other hand, is about creating a future state of our forests. The degree to which the strategy proves appropriate and is achieved may influence future, but not necessarily present, AAC determinations.

This strategy is founded on readily available information and the knowledge of forestry professionals. It is intended as an interim strategy until a more in-depth analysis-based review is completed.

Methodology

This strategy was prepared through the following process:

1. Prior to the district working session, L. P. Atherton & Associates prepared a preliminary draft of this document, summarizing all available information relevant to a strategy and identifying opportunities to improve the future quantity and quality of timber supply.
2. A district working session was held July 29 & 30, 1998 in Port McNeill, attended by representatives of the MOF and forest licensees of the Kingcome TSA. Larry Atherton of L. P. Atherton & Associates and Doug Williams of Cortex Consultants Inc. led the session. Participants reviewed the potential opportunities identified in the draft document along with others that arose. The outcome of the session was a regime table, complete with priorities. August 31, 1999, district staff further refined the next 5 years and incorporated those changes with this document.
3. The consultants incorporated the results of the working session into the draft document and added forecasts of future harvest quantity and quality and of job outcomes.
4. After ministry review, the consultants submitted a completed strategy document to the MOF in electronic format as version 1.0. (The ministry will assign higher version numbers (e.g., 1.1, 1.2, etc.) as the strategy evolves and changes are made.)

Acknowledgments

The participation of representatives of the following organizations at the district working session is gratefully acknowledged.

Ministry of Forests:

- Port McNeill Forest District
- Vancouver Forest Region.

Forest licensees of the Kingcome TSA:

- TimberWest
- MacMillan Bloedel
- Western Forest Products
- Interfor
- Canfor

The project was managed by Mr. Larry Sigurdson of the Ministry of Forests, Vancouver Forest Region. Funding was provided by Forest Renewal BC.

Basic Data

After publication of the Analysis Report, the BCFS corrected a data error, increasing the timber harvesting land base by 1%. Information below is noted as corrected or uncorrected, as available.

Land Area

Description	Area (ha)	Area %
Total Area of TSA	1 126 100	
Total Productive Crown Forest	519 700	
Net Timber Harv. Land Base	177 900	

Corrected THLB - rounded to nearest 100 ha.

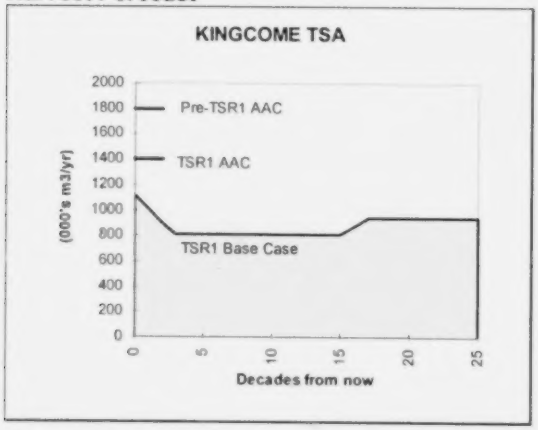
AAC

AAC Type	Pre-TSR	TSR1*	Change (%)
Conventional	1 798 270	1 244 000	-30.8
Deciduous	-	25 000	∞
Insect/Disease	-	-	
Marginal	-	130 000	∞
Total	1 798 270	1 399 000	-22.2

Woodlot AAC 10 278

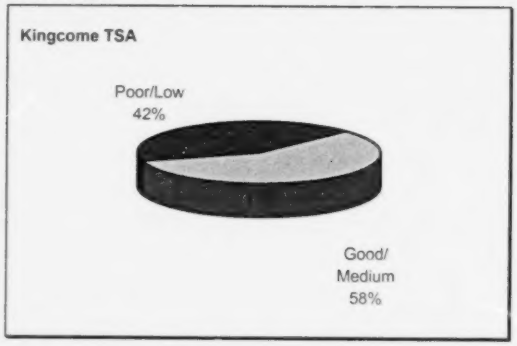
*effective Nov 1/96

Harvest Forecast



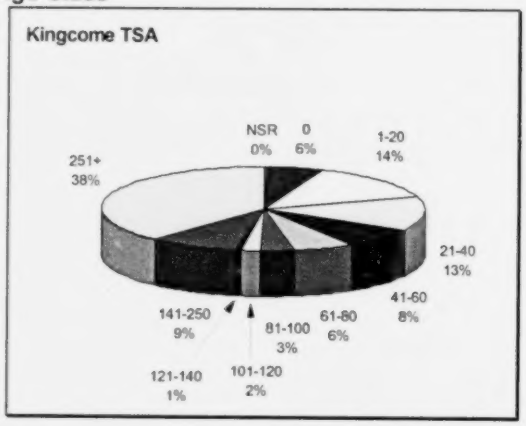
Corrected THLB

Site Class



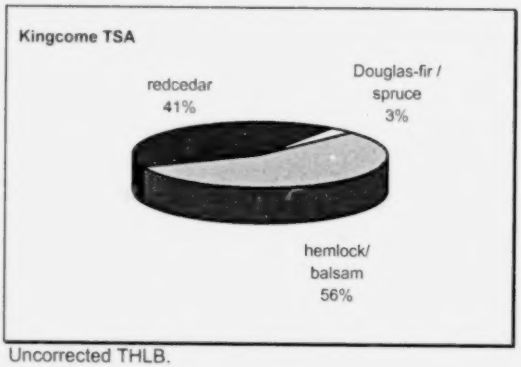
Uncorrected THLB

Age Class



Uncorrected THLB. Data scaled from chart in TS analysis report.

Tree Species



Uncorrected THLB.

Issues

Individual Issue Analysis

The following information is primarily from documentation produced under the first timber supply review, or TSR1. Sources are noted, with full references given on page 43. Only information which is relevant to an incremental silviculture strategy is recorded. Key statements are bolded.

Due to the discovery of a data error (the THLB was increased 1% following correction), a different base case was used in the AAC rationale from that in the TSR report. Some of the information below may therefore not precisely correspond with the corrected base case.

Abbreviations: AAC - allowable annual cut; THLB - timber harvesting land base; IHL - initial harvest level; LTHL - long term harvest level; CF - chief forester; TSR - timber supply review; VQO - visual quality objective.

♦ Fall Down	Base case is for the conventional coniferous component of the TSA (rationale, 44). "Current AAC" assumed to be 1 658 770 m3, after a 139 500 m^3 deduction for allocated woodlots, deciduous stands, and stands with low productivity (total pre TSR AAC: 1 798 270 m^3). Corrected base case **initial harvest level is 1 117 600 m^3, 33% below current AAC,** declining thereafter at a rate of 10%/ decade to a mid term level of 811 600 m^3 after 3 decades (**51% below current AAC, 27% below initial harvest level)**, rising to a long term harvest level in decade 16 of 963 600 (**42% below current AAC, 14% below initial harvest level**). (rationale, 11)
♦ Age Class	Approximately **38% of THLB in stands aged 251+**, having implications for green-up and adjacency constraints. **Only 6% of THLB in stands aged 81-140**, resulting in mid term harvest levels below LTHL for an extended period. (TSR report)
♦ Forest Cover	*IRM Zone*: 59% of THLB. Base case requirement of at most 25% of THLB permitted to be < 3 m tall (4 pass system). Sensitivity test of ± 1 pass. Relaxation: (3 pass) Moderate sensitivity, increase of 8% in first 4 decades, otherwise not sensitive in mid or long term. **Other factors restrict the response.** Increase: (5 pass) **Highly sensitive in the short term**. Initial harvest level 28% below base case. Slightly below mid term base case. No effect long term. *Visual Quality Zones*: 41% of THLB. Base case requirement of at most 4% (high sensitive areas), 14% (medium) and 24% (low) to be < 5 m tall. Sensitivity test of ± 5%. (analysis, 42-43) Relaxation: (+5%) Moderately sensitive - increase of 8% in first 3 decades, **almost eliminates mid term shortfall**. Long term insensitive. Increase: (-5%) Highly sensitive - decrease of 10% in first 3 decades, 17% over mid long term, and 7% below long term. [Indications are that some VQO's will be re-classified prior to TSR2, and that while VQO's will be less restrictive than in TSR1 they will still be significant.[3]] *Green-up*: Base case uses avg of 14 yrs for 3 m green-up in IRM zone and 19 yrs for 5 m green-up in VQ zones.

[3] Source: MoF Port McNeill Forest District. Hereafter noted in the text as (PMFD).

Sensitivity test of ± 5 years.

Decrease: (- 5 yrs) Two alternatives indicate either higher short term volumes (+22% over 1st several decades) or higher mid term volumes (+9.5% over base case - **almost eliminates mid term shortfall**), but not both, can result from lowering green up ages 5 years. Long term insensitive.

Increase: (+ 5 yrs) **Highly sensitive** - initial harvest level 41% below base case. Rises to base case in decade 13. LTHL 1.5% below base case.

Change to green up ages is more sensitive than changes to adjacency due to the large existing area already below green up age. **Lowering green up ages makes more adjacent area available to a greater extent than relaxing adjacency constraints.**

Site indexes are potentially underestimated by 4 m, which would result in a 3 yr reduction in green-up ages. A sensitivity test of - 3 years indicates the **initial harvest level could be 18% higher** than corrected base case if time to green-up is reduced 3 years. (rationale, 29) CF does not explicitly accept that site productivity has been underestimated and green-up periods over-estimated, but accepts the likelihood that this offsets other uncertain factors which may reduce short term timber supply (rationale, 46).

- Backlog NSR

350 ha of backlog NSR. Assumed to be restocked within 3 - 5 years. CF considers this a minor over-estimation as will become either deciduous or will be understocked.

- Quality

- 11 451 ha of non-merchantable forest types deducted from THLB (approx 10 000 ha deciduous and 1 450 low quality pine). Partition of 25 000 m3 for deciduous species.
- 816 ha of brush deducted from THLB.
- 25 478 ha of low productivity sites deducted from THLB. Partition of 130 000 m3 of AAC for low productivity sites.

- Older Forests

Base case does not include a requirement for old growth or biodiversity as there are no specific provisions applied operationally in the TSA.

Relaxation: N/A

Increase: Sensitivity analysis indicates the impacts of biodiversity and riparian requirements could result in a 5.7% decrease in initial harvest levels from the corrected base case. [Sensitivity analysis on the uncorrected base case for the addition of a requirement for at least 10% of stands being older than 140 years indicates that all terms are sensitive. **Long term is 5% below base as it forces the harvesting of stands at ages past the point of maximum growth rates.**]

- Min. Harvest Ages

Base case uses ages within 5% of culmination ages as min. harvest ages. Sensitivity analyses on uncorrected base case of ± 10 and ± 20 yrs. Slight sensitivity (± 2%) to 10 yr change only in decades 4 to 16.

Decrease: (- 20 yrs) Short and long term insensitive. Mild sensitivity mid term, with harvest levels slightly higher than uncorrected base case (+2%).

Increase: (+20 yrs) Short and long term insensitive. Mild sensitivity mid term, with harvest levels 5% lower than uncorrected base case.

Effects are considerably greater when a 20 yr reduction in minimum harvest ages is combined with a 30% increase in regenerated stand volumes, as would be the result were site indexes increased by 4 m (see "Site Productivity").

- Silvicultural Systems

Most of the THLB is currently managed under a clearcut harvesting system. Some harvesting is clearcut with reserves. CF notes potential to increase harvests in visually sensitive areas using alternative silvicultural systems.

- **Regeneration Delay**

  Approximately 40% of harvested areas are regenerated naturally (rationale, 23). Regeneration delays in the TSR analysis were 3 years for Douglas-fir and spruce and 5-6 years for cedar, hemlock and balsam (analysis, 78). Those areas having a 6 yr delay were subsequently found to be regenerated in 5 years. A sensitivity analysis indicated **initial harvest level could be increased 1.2%** due to this change [likely due to a 1 yr reduction in green-up age], which CF took into consideration in AAC determination (rationale, 23).

  Deer browse and Sitka spruce leader weevil are the most significant impediments to regeneration. However, losses are not of sufficient magnitude to cause CF to make an AAC adjustment. (rationale, 24)

  Potential to reduce all delays to 3 years if all areas are planted (rationale, 23).

  Sensitivity test of ± 3 yrs. (analysis, 39-40; uncorrected base case) All periods are sensitive.

  Decrease: (- 3 yrs) **Very sensitive in the short term**, with harvest levels 12% above the base case for the 1st 3 decades. Moderate sensitivity mid term, with harvest levels 5% higher than base case. LTHL 2% higher.

  Increase: (+3 yrs) Harvest levels 8% below base case for the 1st 3 decades. Mid and long terms 5% and 3% lower than base case, respectively.

- **Site Productivity**

  Information from adjacent areas indicates site indexes may be underestimated by 4m. If site indexes are underestimated 4 m, estimates of min harvestable ages decrease by 20 yrs and regenerated stand volumes increase 30%. (rationale, 21) Sensitivity analysis indicates **this combination could increase mid and long term harvests by 11% and 29% respectively** (analysis, 38).

  A site productivity increase of 4 m would also decrease green-up periods by 3 yrs, resulting in an 18% increase above the base case initial harvest level. (rationale, 21)

- **Estimates of Timber Volumes**

  [All of the following is with respect to the uncorrected base case.]

  VDYP - existing stands (analysis, 80). TIPSY - regenerated stands (analysis, 82).

  Existing stand volumes: An inventory audit found inventory existing stand volumes to be overestimated by 11% for the TSA as a whole (rationale, 45). While the CF considers this not to be fully quantified, based on the sensitivity test below, **this indicates short and long term harvest level reductions below the base case of approximately 120 000 and 50 000 m3/yr respectively**.

  Sensitivity test for ± 10% in volume. Highly sensitive to both in short and mid terms. Long term insensitive.

  Increase: (+10%) **Highly sensitive.** Increases volumes in 1st several decades by 10% and over mid term by 8% (due to some harvesting of regenerated stands).

  Decrease: (-10%) **Highly sensitive.** Initial volumes reduced 10% below base case for 1st 3 decades and 6% below for decades 4 - 16.

  Regenerated stand volumes: OAF 1 - 15%, OAF 2 - 5% (analysis, 78).

  Sensitivity tests for ± 10 and ± 25% in volume. Short term insensitive to either. Highly sensitive to both in long term.

  Increase: (+10 or +25%) LTHL 10 or 25% higher than base case, starting to rise from mid term shortfall 150 years from now. 10% change insensitive in mid term but **25% change gives a 7% increase in this period**. [Both scenarios exacerbate the mid-term dip below LTHL in base case- potential for commercial thinning?]

  Decrease: (-10 or -25%) LTHL 10 or 25% lower than base case. 10% change insensitive in mid term but 25% change gives a 13% decrease below base case starting at decade 8.

Summary of Issues by Period

Short Term (1 - 20 yrs)

Short term harvest levels are highly sensitive to changes in green-up ages, and consequently to regeneration delay. Lowering green up ages makes more adjacent area available to a greater extent than relaxing adjacency constraints. This is because of the large existing area currently below green-up age.

An inventory audit found mature stand volumes to be overestimated by approximately 11 percent. Based on TSR sensitivity analysis results this can be expected to result in short term harvest levels in the order of 120 000 m^3/yr less than the base case. However, the CF considers this to be offset by the possibility that green-up ages are overestimated (because site indexes are underestimated), which is an approximately equal upward influence on short term harvest levels.

Mid Term (21 - 160 yrs)

Only 6 percent of stands are aged 81 - 140 years, contributing to mid term harvest levels being below the LTHL for an extended period.

Relaxing adjacency requirements in the visual quality zones almost eliminates the base case mid term harvest shortfall, indicating the potential for partial harvesting or commercial thinning in these zones. Similarly, achieving green-up earlier through silviculture practices (effectively lowering green-up ages) can also eliminate the mid term shortfall.

As a result of inventory audit findings, mid term harvest levels are likely in the order of 50 000 m^3 (6%) below the base case (see "Short Term"). Potentially offsetting this decrease is the finding that, if site indexes are underestimated 4 m, estimates of min harvestable ages decrease by 20 years and regenerated stand volumes increase 30 percent. Sensitivity analysis indicates these could result in an 11 percent increase in mid term harvest levels.

Long Term (161+ yrs)

Long term harvest levels are sensitive to the imposition of an older forest constraint (currently there isn't one) as it forces the harvest of stands beyond culmination age. A requirement for 10 percent of stands to be older than 140 years at all times results in a 5 percent reduction to the long term harvest level.

The long term is otherwise only sensitive to changes in regenerated stand volumes. A 1 percent increase or decrease in regenerated volumes results in a corresponding 1 percent increase or decrease to the LTHL. An increase in LTHL increases the difference between the mid term and long term harvest levels, thereby increasing the opportunity for silvicultural practices to bring forward volumes from the long term into the mid term.

Future

Future factors to be considered in determining an incremental silviculture program include:

- further reductions in land base resulting from implementation of the Vancouver Island Land Use Plan;
- the implementation of biodiversity and old growth plans.

Incremental Silviculture History
Approximately 2 000 ha are harvested annually.

Treatment	TSR1 Status (1994)		Current Status (1998)
	Incorporated in Timber Supply Analysis	Not Incorporated in Timber Supply Analysis	Source: PMFD
♦ Backlog	350 ha to be reforested in 5 years, aggressively over the next 2years according to Janna Kumi's letter dated Jan 17th, 1997 (rationale, 25).		About 350 ha require site preparation and planting. Expected to be completed in 2 years.
♦ Backlog Brushing /Conifer Release	500 ha/yr, on Vancouver Island and the mainland portions of the TSA.		
♦ Conversion	600 ha of alder overstory to be treated, releasing HC understory.		
♦ Commercial Thin		None.	None.
♦ Space		Approx. 5 000 ha spaced since 1980 (rationale, 26).	1999 level approx. 100 ha/yr.
♦ Prune		None indicated at time of TSR1.	1998 level approx. 100 ha/yr. Typical treatment is 1 lift prune to 2/3rd's of the trees in a spaced stand
♦ Fertilize			Intensively treated in 1998, more still available. Could support a program of 500 ha/yr. Target is age class 1 & 2 cedar, poor to low site class.

Higher Level Goals and Objectives

This section documents higher level goals and objectives relevant to an incremental silviculture strategy for the TSA.

Provincial Goals

Fundamentally, government's goals can be characterized as:

- sustainable use;
- community stability; and
- a strong forest sector. (MOF, 1998a)

Provincial Objectives

Until provincial targets for timber quantity and quality are established, management unit strategies are to consider the following interim provincial strategic objectives (MOF, 1998a). Incremental silviculture strategies must also be in keeping with higher level plans under the Forest Practices Code.

Objective 1: Maintain current harvest levels as long as possible without creating disruptive shortfalls in future timber supply.

Objective 2: Create a long term timber supply capable of supporting a steady long term provincial harvest level similar to current levels.

Objective 3: Minimize the interim shortfall in provincial harvest anticipated before a steady long term timber supply is achieved.

Objective 4: Create a long term timber supply which will enable the timber quality profile of future harvests to be the same or better than the current profile.

It is recognized that not every management unit has the same capability to contribute to these interim objectives. Further, it is recognized that these objectives may not be attainable at current funding levels. Their purpose is to provide general guidance to the application of available funds.

Regional Objectives

The objectives of the regional incremental silviculture strategy are to:

- Ensure a long term sustainable harvest which approximates the current harvest value and volume levels and that produces a diversified mix of products necessary to create and maintain sustainable forest employment.
- Balance treatments that enhance growth and yield such as fertilizing, spacing and forest health activities with those that increase the value of the wood such as pruning.
- Utilize incremental silviculture treatments to contribute to sustainable management of non-timber values at the landscape level. (MOF, 1998b)

Opportunities to Increase Timber Supply

The Kingcome TSA occurs primarily on the mainland from Knight Inlet in the south to Cape Caution in the northwest and inland to Tweedsmuir Park. Smaller portions of the TSA are located at the northern tip of Vancouver Island and adjacent to Brooks Bay on the west coast of Vancouver Island. Steep terrain and lack of access limit the ability to offset projected timber supply reductions.

Opportunities Indicated Through TSR Sensitivity Analyses

TSA modelling in support of planning incremental silviculture has not yet been undertaken. In its absence, sensitivity analyses from the TSR1 analysis report are the best source of information as to the opportunities for incremental silviculture to increase future timber supply. The following are selected sensitivity analsysis charts from the TSR1 analysis report, to which opportunity information is added. Detailed analyses are required to confirm the indicated effects.

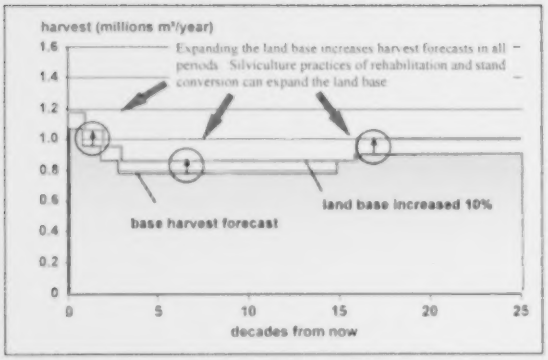

harvest (millions m³/year)
Expanding the land base increases harvest forecasts in all periods. Silviculture practices of rehabilitation and stand conversion can expand the land base
land base increased 10%
base harvest forecast
decades from now

Figure 1. Changes in land base, Kingcome TSA

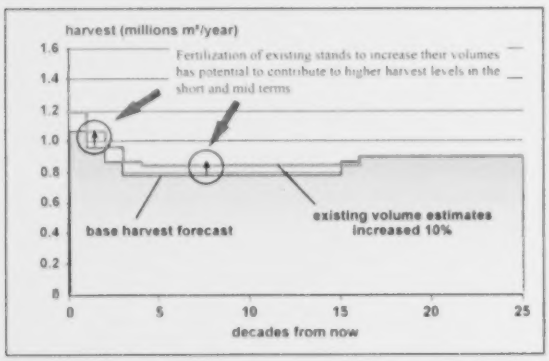

harvest (millions m³/year)
Fertilization of existing stands to increase their volumes has potential to contribute to higher harvest levels in the short and mid terms
existing volume estimates increased 10%
base harvest forecast
decades from now

Figure 2. Changes in existing stand volumes, Kingcome TSA

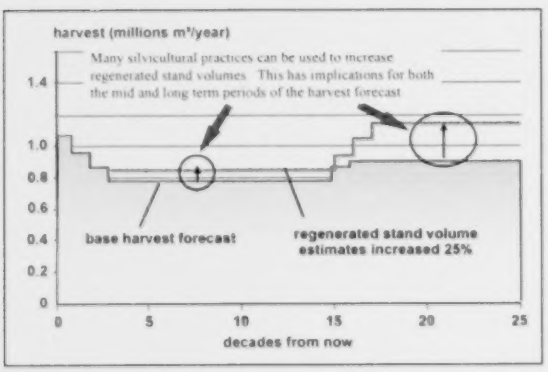

harvest (millions m³/year)
Many silvicultural practices can be used to increase regenerated stand volumes. This has implications for both the mid and long term periods of the harvest forecast
regenerated stand volume estimates increased 25%
base harvest forecast
decades from now

Figure 3. Changes in regenerated stand volumes, Kingcome TSA

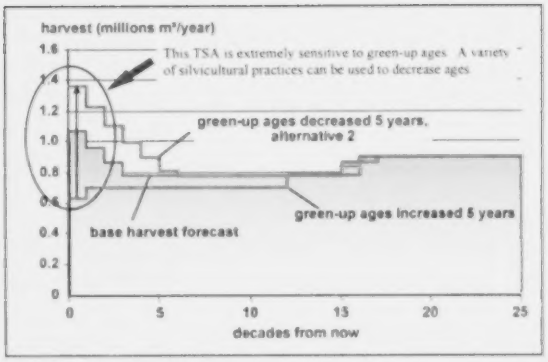

harvest (millions m³/year)
This TSA is extremely sensitive to green-up ages. A variety of silvicultural practices can be used to decrease ages
green-up ages decreased 5 years, alternative 2
green-up ages increased 5 years
base harvest forecast
decades from now

Figure 4. Changes in green-up ages, Kingcome TSA

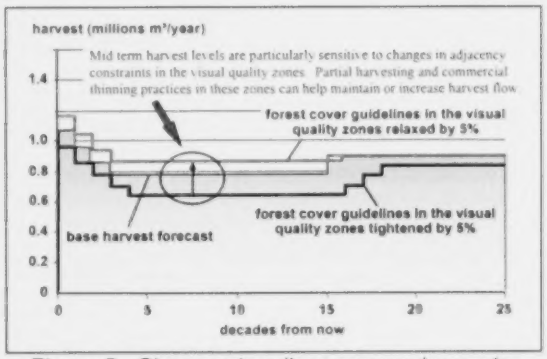

harvest (millions m³/year)
Mid term harvest levels are particularly sensitive to changes in adjacency constraints in the visual quality zones. Partial harvesting and commercial thinning practices in these zones can help maintain or increase harvest flow
forest cover guidelines in the visual quality zones relaxed by 5%
forest cover guidelines in the visual quality zones tightened by 5%
base harvest forecast
decades from now

Figure 5. Changes in adjacency requirements, Kingcome TSA

Preliminary Identification of Silviculture Opportunities

Information in the previous sections indicates the following silvicultural strategies may have potential to increase future timber supply. Each of the potential strategies was discussed in detail in the district working session, the results of which are recorded in "Potential Strategies by Response Time Frame," along with additional strategies that arose during the meeting. Strategies that are ultimately adopted are noted in "Silviculture Strategies".

Short Term (1 - 20 yrs)

ST 1: complete site index and existing stand volume estimation studies.

ST 2: achieve green-up 3 years earlier through a variety of actions.

ST 3: overcome adjacency limitations by implementing partial harvesting/CT regimes in VQO zones.

Mid Term (21 - 160 yrs)

MT 1: reduce regeneration delay 2 yrs by planting all areas.

MT 2: continue partial harvesting/CT regimes as in ST 3.

MT 3: increase the volume of regenerated stands by 20% through a variety of actions.

MT 4: move volume forward from the long term to the mid term.

MT 5: conduct extensive fertilization trials in hemlock stands to be able to increase the volume of existing hemlock stands.

Long Term (161+ yrs)

LT 1: increase the volume of regenerated stands by 20 percent as in MT 3 above.

Available Information Regarding Potential Treatments and Treatable Area

This section summarizes available information directly relevant to the potential treatments for the TSA.

Treatment	Comment	Treatable Area
♦ Alternative Silvicultural Systems	Use of alternative systems in visually sensitive areas could increase availability of timber for harvesting. A recently issued forest licence located in lower Knight Inlet requires alternative harvesting and silvicultural systems. MacMillan Bloedel is planning a transition to alternative systems over the next 5 years.	41 % of TSA is visually sensitive.
♦ Spacing	Spacing has been applied in some younger existing stands.	
♦ Fertilization	Very little fertilization in the TSA. Variable response in H. Few Fdc stands. Cedar stands give response but many stands are remote and therefore costly to treat. A greater knowledge of growth and yield responses of hemlock to fertilization is needed (PMFD). Cw/Hw salal sites achieve crown closure (CC) at approximately 7 m, which shades out competing salal. Prior to CC, salal reduces site potential through nutrient competition. Stands show significant response to a regime of fertilization at time of planting, plus 1 or 2 more applications to achieve early CC. 90%+ of Cw sites are	Little treatable area amongst older stands. Significant early tree ht. growth found in SCHIRP trials in cedar - salal associations.

Treatment	Comment	Treatable Area
	planted.	
♦ Commercial Thinning	None to date. CF expects district staff to analyze potential for CT and, if feasible, to implement a CT strategy. (rationale, 27) Approx. 17% of forests in the THLB are 30 to 80 years old and may be candidates for commercial thinning. 10 400 ha of H stands 40 -60 years old. Steep terrain and lack of access limits availability. (rationale, 26-27)	About 10 000 ha of suitably aged stands are located on the mainland. Of these, 3 000 ha are considered accessible (PMFD).
♦ Backlog NSR	All backlog scheduled to be restocked in next 2 years. No additional opportunity.	0

Potential Strategies by Response Time Frame

Explanatory notes with respect to the following tables.

Column Number	Note
1	The response time frame is the period in which the anticipated result is expected, not the period in which actions must necessarily commence.
2	Strategy numbers correspond with the numbers recorded earlier in "Preliminary Identification of Silviculture Opportunities,". Items followed by an asterisk (*) were added during the district working session.
3	Information is largely from a meeting of ministry personnel and forest licensees held July 29 & 30, 1998, (the "district working session") combined with information presented earlier in this document.
4	Anticipated results are typically calculated using the timber supply response indicated by TSR1 sensitivity analyses.
5	The harvest forecast for the short term uses the TSR1 AAC as the starting level in the first decade, and the TSR1 AAC less 10% for the 2nd decade (as per the base case). Mid and long term harvest forecasts take the corrected base case levels from TSR1 as the starting levels, adjusted upwards by 10% to recognize the partitioned AAC for low productivity sites and associated timber harvesting land base increase (see rationale, 17). The harvest forecast column was not thoroughly reviewed during the district meeting. *Results are largely conjecture and are meant to illustrate the potential of the strategies.*

In the AAC rationale, the chief forester identified a number of potential downward influences on timber supply. For the purposes of this strategy, however, a status quo is assumed with respect to these. Should any arise, the following strategies would serve to mitigate their effects rather than increase timber supply.

Response Time Frame	Potential Strategy/Action	Discussion / Current Status	Anticipated Result	Potential Harvest Forecast (000 000s m3/yr)
• Short Term (1 - 20 yrs)	1. Complete site index & existing stand volume estimation studies. 2. Achieve green-up 3 years earlier in VQ zones by: (a) planting large genetically improved stock; (b) increasing proportion of area planted & plant all areas sooner (to reduce regeneration delay 1-2 yrs); (c) brush for growth enhancement; and/or (d) fertilize suitable regenerated stands to increase their growth. 3. Implement partial harvesting/CT regimes in VQO zones to increase timber supply from areas limited by adjacency constraints.	1. The need for completion of these studies is noted under "Summary of Information and Research Needs," page 39. 2. Green-up is a policy issue and requirements are subject to change. The best opportunities to achieve earlier green-up are pre-free growing. TSR1 ages to reach specified tree heights. Species / FG / 3M / 5M Cw / 7-8 / 14 / 20 H/B / 5-8 / 5-8 / 10-12 Overall, approx. 60%+ of harvested areas are currently planted (Cw, Hw, Ba, minor Fdc). Natural regeneration is common on N to NE aspect Hw/Ba sites. 2.(a) Planting larger stock is a basic silv matter - not likely to change w/o funding assistance. Genetically improved stock will reach green-up sooner than stock from "wild" seed, although gain in years is not known. See MT3 re yield gains. All Cw and Hw seed is "A" class. No Ba available. 2.(b) Reducing regen delay is a basic silv matter. TSR1 regen delay for Fdc & S is 3 yrs. Current practice is to plant in 2 yrs. Very high plantation success rate. (relatively little of these species in this TSA). TSR1 regen delay for Cw is 5 yrs. Current practice is to plant in 1-2 yrs. Very high plantation success rate. TSR1 regen delay for Hw natural is 5 yrs. Current practice is 3 yrs. If planted (not likely to change w/o funding assistance), would likely be 1-2 yrs. 2.(c) Brushing is currently for survival - unlikely to change within current funding structure. 2.(d) Fertilizing Cw is an option. See discussions under MT 3 & MT 5 below. 3. Some partial harvesting is planned. Will likely increase when there is no alternative to harvesting in areas limited by forest cover constraints. About 3 000 ha currently available on the mainland for CT, but no plans.	1. N/A - results of the two studies may be largely offsetting. 2. TSR1 indicates a 3 yr earlier green-up yields an approximately 18% increase in harvest levels in the 1st decade. Assume 3 yr earlier green-up achieved on ½ of areas (0.5 X 18% ⇒ 9%) (or 1.26 X .09 = .11). 3. TSR1 indicates an 8% increase in ST harvests from relaxing requirement of area allowed to be not greened up by 5%. Assume achieved on ¼ of areas. (0.25 X 8% ⇒ 2%)	1.40 1st dec. 1.26 2nd dec. 0.11 grn-up 0.03 prt harv 1.40 total

Response Time Frame	Potential Strategy/Action	Discussion / Current Status	Anticipated Result	Potential Harvest Forecast (000 000s m3/yr)
		During discussion of this topic in the district working session, regenerated stand yields for the TSA were questioned. There was a strong feeling TIPSY yields for Hw in particular were underestimated. Noted under "Summary of Information and Research Needs," page 39.	4. N/A. Studies required.	
	4. Increase the volume of some existing stand volumes through fertilization.*[4]	4. Hw response is variable. Studies required to confirm fertilization potential.	5. (a) Already in base case forecast.	
	5. Expand the timber harvesting land base through:*			
	(a) rehabilitating backlog NSR;	5.(a) **Remaining 350 ha is mostly on the mainland portion of the TSA and will be stocked in next 2 yrs. About 3 000 ha of backlog brushing required** to release conifers on previously harvested areas. Impacts already included in TSR1 base case.	(b) 8 000 ha of drainage =4.5% of THLB. Expect to change site quality from low to poor, ∴ possible 3% gain. Due to experimental nature and need for public review, this is not included in potential ST harv forecast.	
	(b) draining low site wet lands in the Nawhitti Plateau and Standby area; and	5.(b) About 40 000 ha classified as Cw 921 P/L. About 8 000 ha may be treatable at $3 000/ha. Requires 1 m ditches 30 m apart. Would require environmental and public review. **Consider experimental for now, with a 10 ha trial.**	(c) Assume 2 000 ha may be rehabilitated to G site conifer = 2/178 THLB.= 1%. However, not likely completed within ST.	
	(c) rehabilitating non-commercial alder stands.	5.(c) Considerable area in alder which is operable but not commercial. Would need to co-ordinate with alder licensee to determine treatable areas. Requires further study - **program not likely to start in next 5 yrs & then would take 15 yrs to complete.**		
♦ Mid Term (21 - 160 yrs)	1. Plant all areas to reduce regeneration delay by 2 years.	1. See discussion under ST 2 above. This is a basic silv. activity.	1. Potentially overlaps with gains from reducing time to green-up, but treated as an indication of mid term potential. Sensitivity analysis indicates a 5% gain with a 3 yr reduction, ∴ (2/3 X 5% ⇒ 3%.	0.81 base 0.08 THLB adj 0.89 Adj base + 0.03 rgn dlay 0.03 prt harv 0.05 rgn vol 0.02 fert Cw 0.01 inc THLB 1.03 total See p 28 re THLB adjustment.
	2. Overcome adjacency constraints in VQO zones by:			
	(a) partial harvesting; and	2. (a) See discussion under ST 3 above.	2.(a) Sensitivity analysis indicates a 11.5% gain with a 5% relaxation in constraints. Assume achieved on ¼ of areas. (0.25 X 11.5% ⇒ 3%)	
	(b) setting up stands for CT through	(b) Some areas are currently being spaced to set up for CT. However, although 33% of THLB is in stands ≤ 40 years old, few of these meet the criteria of better site, high visibility and economically accessible. Only 2-	2.(b) Slight positive impact - not estimable.	

[4] * - indicates potential strategies that were added during the district working session.

[5] Source: participants at Fraser TSA working session.

Response Time Frame	Potential Strategy/Action	Discussion / Current Status	Anticipated Result	Potential Harvest Forecast (000 000s m3/yr)
	spacing.	3% of stands in this age group are considered suitable for CT and would support **a program of approx. 200 ha/yr**.	3. Sensitivity tests indicates a 25% increase in regenerated stand yields will increase MT harvests 7%. At least a 20% gain can be anticipated through implementation of the indicated actions ∴ 20/25 X 7% ⇒ 6%.	
		3. (a) & (c) - see discussions under ST 2 above.		
	3. Increase regenerated stand volumes 20%:	3. (b) Approx. 60%+ of harvested areas are planted. Fdc, Cw & Hw seed is "A" class. Latest estimates of yield gains are (%):[5]		
	(a) reducing time to regeneration;			
	(b) using A class seed or better;			
	(c) using large planting stock;			
	(d) managing stocking to reduce voids 5%;	If areas now managed for natural regen Hw (40% of total area) were planted w genetically improved stock (20% gain), gain could be 40% X 20% ⇒ 8% overall;		
		3. (d) Voids can be desirable for wildlife habitat. Current free growing requirements will result in < 15% in voids, however amount is unknown as must also account for area not in the net area to be reforested (other than allowable roads & landings) and for voids that open up later on. Given the difficult operating terrain of this area, 15% voids may be reasonable. Actual voids could be surveyed. Noted under "Summary of Information and Research Needs," page 39.		
	(e) individual tree fertilizing at time of planting.			
	4. Space all post FG stands to set up for CT to bring forward harvest from long term into mid term.	3. (e) It is now common practice throughout the TSA to fertilize individual trees at time of planting on cedar / salal sites. Post FG is done with FRBC funding, however no funding in 1997. These treatments are done aerial / broadcast for efficiency and effectiveness. See discussions under MT 5 below.		
	5. Fertilize existing (a) hemlock and (b) cedar stands to raise their volumes.		4. N/A	
		4. Currently not much opportunity. Bringing forward harvest from the LT is too far into the future to contemplate or assess now. Noted for future assessment in approx. 50 yrs.		
		5. No fertilization currently taking place.		
		(a) Identify characteristics of hemlock stands that show a fertilization response so treatable area can be expanded. The need for extensive fertilization trials in hemlock stands is noted as a requirement for further research under "Summary of Information and Research Needs," page 39.	5. (a) N/A	
		5. (b) Cw shows an estimated 30% response from fertilizing to force early CC. Once Cw has achieved CC, no further fertilization is required. Two methods of estimating potential were explored. (Method 1) Existing stands between post-FG and age 20 = 8% of THLB. Cw = 40% of THLB. ∴ Cw between FG & 20 = 40% X 8% = 3.2% of THLB, or approx. 5 000 ha. 30%	5. (b) potential gains of between 1% and 4% demonstrated. Conservative estimate ⇒ 2%	
	6. Expand the timber harvesting land base as per ST 5 above*		6. See ST 5 above. Assume 1% increase in THLB. Sensitivity	

Species	1st gen	2nd gen
Doug-fir (Fdc)	3-5	15
Hemlock (Hw)	3	20
Cedar (Cw)	3	10

Response Time Frame	Potential Strategy/Action	Discussion / Current Status	Anticipated Result	Potential Harvest Forecast (000 000s m3/yr)
		gain X 3.2% THLB = 1% gain overall. **Would require a fert. program of approx. 500 ha/yr for 5 yrs.** (Mthd 2) **Estimate up to 15 000 ha of existing Cw stands between post-FG and age 20.** 15 000 ha X 2 m3/ha/yr gain = 30 000 m3/yr or 4% gain overall. 6. See discussions under ST 5 above.	analysis indicates this results in a 1% increase in MT harvest levels ⇒ 1%. Effects may add or compound. Increased site productivity may further compound these effects. Age reduction factors may overlap, with the combined total being less than when separately analyzed.	
• Long Term (161 + yrs)	1. Increase regenerated stand volumes 20% as per MT 3 above. 2. Expand the timber harvesting land base as per ST 5 above*	1. See discussion under MT 3 above. 2. See discussion under ST 5 above.	1. See MT 3 above. ⇒ 20% 2. See discussion under ST 5 above. Assume 1% increase in THLB. Sensitivity analysis indicates this results in a 1% increase in MT harvest levels ⇒ 1%. Effects may add or compound. See note above.	0.96 base 0.10 THLB adj 1.06 Adj base 0.21 rgn vol 0.01 inc THLB 1.28 total

Potential Harvest Forecast

Figure 6 graphs the potential harvest level that may be attained through implementation of the silvicultural strategies in the preceding tables. This forecast is highly speculative and requires confirmation through computer-based modeling and analysis. It also includes silvicultural activities that are not within the traditional scope of incremental silviculture. Modeling may indicate more precise timing, targeting and program levels associated with incremental silviculture activities than could be developed in this interim strategy.

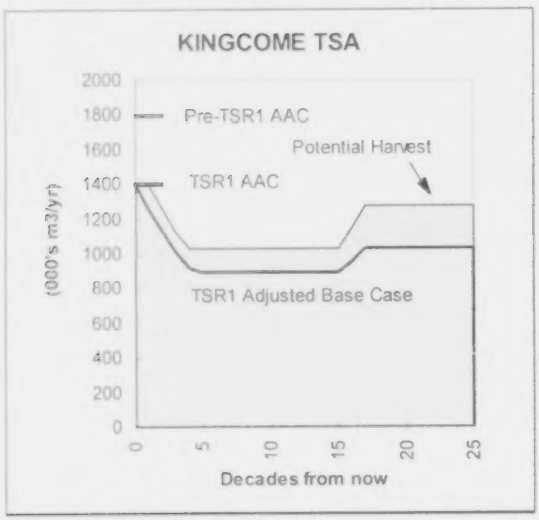


Figure 6. Potential harvest forecast, Kingcome TSA

TSR 1 base case adjusted as follows:

- initial harvest level set at TSR 1 AAC;
- next 4 decades decreased at 10%/decade, same rate as TSR 1 base case;
- mid-term trough & long term increased 10% in recognition of a 11% increase in THLB associated with adding low sites (not previously included in the base case). Because low site, a 10% factor was used rather than 11%.

Opportunities to Improve Timber Quality

The effects of incremental silviculture on the future quality of the timber resource were not analyzed in the timber supply review. Information in this section was gathered during the district working session.

Product Objectives

The following are product objectives at the log level for the Kingcome TSA.

Quality Class	Species	Characteristics
Premium Log:	Hemlock	60+ cm DBH, clear, min 5 m log, not less than 3-4 rings/cm on M/P sites and 2-3 rings/cm on G sites.
	Cedar pole	45+ cm min DBH, min 20 m log, low taper, min 20 cm top.
	Balsam	60+ cm DBH, clear, min 5 m log.
Sawlog:	Minimum average stand DBH of 45 cm and min. stand vol. of 350 m3/ha.	

Available Information Regarding Potential Treatments and Treatable Area

Treatment	Comment/ Potential Treatment Regimes	Treatable Area
• Spacing		
• Commercial Thinning		
• Pruning	Stands are spaced to 850 stems/ha and 2/3$^{rd's}$ of these are pruned (PMFD). Stands on G-M sites will reach 45 cm dbh in 85 yrs and are 45 m tall.	
• Space/ Prune		
• Space/ Prune/Fert		

Potential Strategies by Response Time Frame

The following strategies have potential to increase timber quality. These were identified in the district working session. The response time frame is the period in which the anticipated result is expected, not the period in which actions must necessarily commence.

Response Time Frame	Potential Strategy/Action	Discussion / Current Status	Anticipated Result	Premium Log Forecast
♦ Short Term (1 - 20 yrs)	None	Short term harvests will come from existing very old stands which are not treatable to improve quality.	Quality profile of existing old growth will prevail. Assume this is equal to a recent coast-wide estimate of 15%.	15%?
♦ Mid Term (21 - 160 yrs)	1. Prune 100 ha/yr to 3.5 m to yield a 5 m log and prune 75 ha to 5.0 m over the next 2 years.	1. Because of cost, a single pruning lift is normal practice. **Spacing is a pre-requisite to pruning.**	1. 150 ha is approx 5.3% of annual area harvested. However, only 2/3rds of stems are pruned. Assume 3.5 m log is 10% of tree vol. (.053 X 2/3 X .10) ⇒ .5%.	1. 1% clear 2. 3% poles Total: 4%
	2. Manage selected stands to higher densities to yield pole-sized trees.	2. TIPSY indicates that for Cw with an initial density of 4 000 st/ha, SI 30, at age 100, 28% of stems will be > 50 cm dbh.	2. No estimate available. If 1/3 of Cw leading species (14% of THLB) is higher density Cw and 25% of stand is poles ⇒ 3% of future harvests will be poles.	
	3. Space 100 ha/yr to prepare stands for pruning and CT regimes.	3. Target stands are hemlock/balsam > 5 000 st/ha. The TSA has high harvesting and transportation costs. Spacing concentrates volume on fewer, larger logs, thus reducing future costs. Also brings harvest ages forward, enabling CT.	3. Sawlog oriented but pre-requisite to pruning. No premium log effect on its own.	
♦ Long Term (161 + yrs)	As above.	As above.	As above.	4%

Timber Quality Forecast

The foregoing analysis indicates the premium log content of harvests in the mid and long term will be substantially lower than today's levels (4% forecast vs. current estimate of 15%). A higher level of pruning program than currently planned would serve to improve future timber quality, however, there is a lack of treatable stands due to accessibility and cost.

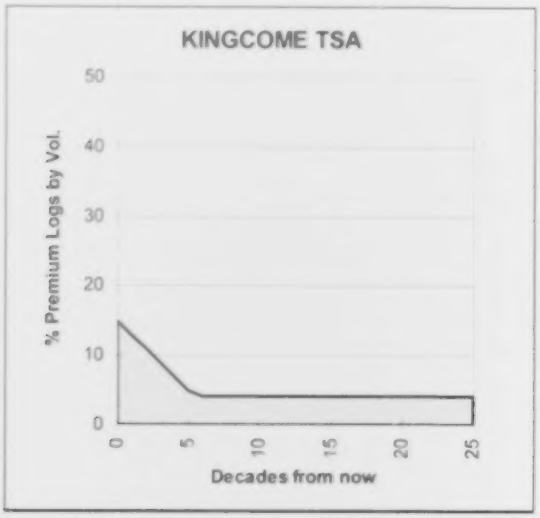


Figure 7. Potential Quality Forecast, Kingcome TSA

Incremental Silviculture Strategy

This section synthesizes the preceding background information and analysis into an incremental silviculture strategy for the TSA.

General Strategy

The Kingcome TSA has limited ability to overcome forecast reductions in timber supply in the mid term. Central to increasing future timber supply is the use of 2nd generation or better improved seedlings. Ensuring future timber quality is particularly important, given the indicated trend toward substantially lower premium log harvest levels in the future. Spacing is needed to increase piece size, reduce future harvesting costs, and prepare stands for pruning. Pruning is needed to ensure at least a minimal level of premium logs in the future.

Working Targets

The preceding analysis indicates the following working targets are attainable. Figure 8 illustrates these.

WT 1 (Quantity): Maintain short term harvests at near current levels (TSR 1 AAC of approx. 1.4 million m3/yr) for as long as possible. Manage mid-term timber supplies to yield a harvest of approximately 1.0 million m3/yr and long term supplies to yield 1.3 million m3/yr.

WT 2 (Quality): Manage regenerated stands to yield at least 4% premium logs by volume, with the majority of the remainder being of sawlog quality.

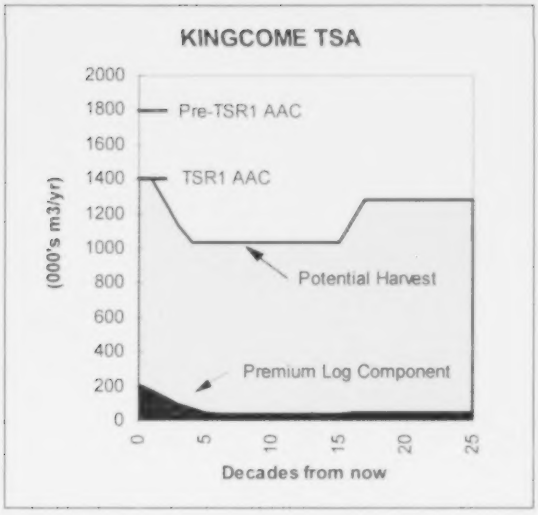


Figure 8. Combined Potential Quantity and Quality Harvest Forecasts, Kingcome TSA

Log Product Objectives

The following are product objectives at the log level for the Kingcome TSA.

Quality Class	Species	Characteristics
Premium Log:	Hemlock	60+ cm DBH, clear, min 5 m log, not less than 3-4 rings/cm on M/P sites and 2-3 rings/cm on G sites.
	Cedar pole	45+ cm min DBH, min 20 m log, low taper, min 20 cm top.
	Balsam	60+ cm DBH, clear, min 5 m log.
Sawlog:	Minimum average stand DBH of 45 cm and min. stand vol. of 350 m3/ha.	

Silviculture Strategies

Strategies to Increase the *Quantity* of Future Timber Supply

The following strategies have identified potential to increase the quantity of the timber supply of the Kingcome TSA. (Strategy numbers correspond with those recorded earlier.)

No.	Strategy
ST2	Achieve green-up 3 years earlier in VQ zones by: (a) planting large genetically improved stock; (b) reducing regeneration delay by increasing the proportion of area planted and planting all areas sooner; (c) brushing for growth enchancement; and (d) fertilizing regenerated stands to increase their growth. (Note: The majority of these are pre free growing silviculture activities. Where licensees can meet their free-growing obligations without undertaking such activities they are not likely to voluntarily undertake them due to the extra cost. In such cases, funding assistance would likely be necessary.)
ST3	Implement partial harvesting / commercial thinning regimes in VQ zones.
MT1	Plant all areas to reduce regeneration delay by 2 years. (Note: This action is with respect to pre free-growing stands and is not within the traditional scope of incremental silviculture.)
MT2	Overcome adjacency constraints in VQO zones by partial harvesting and setting up stands for future commercial thinning through spacing. (Note: There are limited opportunities for commercial thinning in this TSA.)
MT3	Increase regenerated stand volumes 20% by: (a) reducing time to regeneration; (b) using (2nd generation) A class seed or better; (c) using large planting stock; and (d) individual tree fertilization at time of planting and MT 5. (Note: some of these are pre free growing silviculture activities. Licensees have adopted most of these options, but they will not generally use higher cost larger stock if free growing obligations can be achieved without it. (In such cases, funding assistance would likely be necessary.)
MT5	Fertilizing 500 ha/yr of cedar-salal sites for early crown closure.
MT6	Expand the timber harvesting land base by: (a) rehabilitating the remaining 400 ha of backlog NSR and brushing (conifer release) 3000 ha of backlog plantations; (b) draining low site wet lands in the Nawhitti Plateau (10 ha trial); and (c) assessing opportunities for rehabilitating non-commercial alder stands.
LT1	Increase regenerated stand volumes 20% by continuing MT3 above.
LT2	Expand the timber harvesting land base by continuing MT 6 above.

Tree improvement is critical to achievement of a number of the preceding strategies.

Strategies to Increase the *Quality* of Future Timber Supply

The following strategies have identified potential to increase the quality of the timber supply of the Queen Charlotte TSA.

No.	Strategy
Q1	One-lift prune (3.5 m) 100 ha/yr, two-lift prune (5.0 m) 75 ha over the next year.
Q2	Manage selected stands to higher densities to yield pole-sized trees.
Q3	Space 100 ha/yr to increase avg. piece sizes and prepare stands for pruning and commercial thinning.

Strategies to Increase the *Quantity* or *Quality* of Future Habitat Supply

(Note: The following strategy was developed in the district working session during discussion of timber quantity strategy MT7.)

The following strategy has identified potential to increase the quality or quantity of the habitat supply of the Kingcome TSA.

No.	Strategy
	No strategies proposed at this time.

Summary of Information and Research Needs

During the assessment process, the following needs for further information and research became apparent. The outcome of these have implications for an incremental silviculture strategy. Bracketed numbers refer to the strategy numbers under which the need is identified.

1. TIPSY yields for hemlock stands may be underestimated and require confirmation. (ST3)
2. OAF 1 factor of 15% requires confirmation. Survey techniques are available. Requires statistical validity at the management unit level if to be used for AAC determination. (MT3)
3. Old growth site index and existing stand volume estimation studies require completion. It is anticipated that site indexes are underestimated and existing stand volumes are overestimated and that these effects may prove offsetting to some extent. (ST1)
4. Hemlock response to fertilization is variable. Were the causes for this determined there may be considerable potential for hemlock fertilization to improve the harvest forecast. (ST2, ST4, MT5)
5. Trials are required to determine costs, efficacy and social acceptability of draining low-site forest land to increase productivity. (ST5, MT6, LT2)
6. The amount of area in alder stands which are not likely to be commercially harvested and therefore have potential for rehabilitation requires determination. (ST5, MT6, LT2)
7. Research is needed to determine the causes and extent of poor occlusion of branch stubs in pruned cedar which can result in hollow tunnels extending in the tree trunk for some distance past the end of the stub. (Q1)

Silviculture Regimes and Investment Priorities

The following table indicates incremental silviculture regimes which are suitable to attaining the above working targets and strategies.

Regime Table, Kingcome TSA, August ,

Regimes	Strategy	Opportunity Area (Ha/Yr)	Timber Supply Effects			Quality	Habitat	Direct Silv. Jobs Days/ha	Direct Cost $/ha	Rank
			Short	Medium	Long					
Backlog										
1 site prep & planting	ST5, MT6,LT2	200	+	+	+	0	0	4	3000	1
2 conifer release / brushing	ST5, MT6,LT2	500	+	+	+	0	0	4	800	1
Spacing										
3 HemBal M-G <10m >5000 to 850 (set up for CT)	MT2, Q3	100	0	+	0	+	+/0	3	1500-1800	4
Pruning (2/3 of spaced stands)										
4 3.5 m 1st lift	Q1	100	0	0	0	+	+	5	1800	5
5 5m prune	Q1	75 tot over 1 yr	0	0	0	+	+	6	2200	5
Fertilization										
6 Cw age 10-40 M,P	ST2, ST4 MT3, MT5, LT1	500	+	+	+	+	+	.1	600	2
Expand THLB										
7 Drainage	ST5, MT6, LT2	10, study only*	+	+	+	0	-	1	3000	3
8 Alder rehabilitation	ST5, MT6, LT2	assessment								

* Experimental, 1 yr project only

Incremental Silviculture Program

The following annualized program will contribute to achieving the above goals and strategies.

Program Table - Hectares Treated, Kingcome TSA, August 1999

Year	Surveys	Backlog Prep/Plant	Backlog Brushing	Space	Prune - 1	Prune - 2	Fertilize	Drain	Total
1	2,900	200	500	100	100	75	500		4,375
2	2,850	150	500	100	100		500	10	4,210
3	2,700	0	500	100	100	-	500		3,900
4	2,700	0	500	100	100	-	500		3,900
5	2,700	-	500	100	100	-	500		3,900
Subtot Yr 1 - 5	13,850	350	2,500	500	500		2,500	10	20,285
6 - 10	14,500	-	500	500	500	-	2,500	-	18,500
Total Yr 1 - 10	28,350	350	3,000	1,000	1,000	75	5,000	10	38,785
Unit cost ($/ha)	44	3,000	800	1,750	1,800	2,200	600	3,000	

Program Table - $ 000s, Kingcome TSA, August 1999

Year	Surveys	Backlog Prep/Plant	Backlog Brushing	Space		Prune	Fertilize	Drain	Total
1	128	600	400	175	180	165	300	-	1,948
2	125	450	400	175	180		300	30	1,660
3	118	0	400	175	180	-	300	-	1,173
4	118	0	400	175	180	-	300	-	1,173
5	118	-	400	175	180	-	300	-	1,173
Subtot Yr 1 - 5	607	1,050	2,000	875	900	165	1,500	30	7,127
	587	-	400	875	900	-	1,500	-	4,262
Total Yr 1 - 10	1194	1050	2,400	1,750	1,800	165	3,000	30	11,389

Job Outcomes

The following are the anticipated job outcomes associated with the preceding program, assuming the program is maintained into the future as necessary to achieve the working targets.

Program Job Outcomes, Kingcome TSA, August 1998

Short term *employment associated with undertaking the silviculture activity, in person years*

Year	Surveys	Backlog Prep/Plant	Backlog Brushing	Space	Prune	Fertilize	Drain	Total
1	-	1.1	6.7	5.6	17.8	0.3	-	31
2	-	1.1	6.7	5.6	17.8	0.3	0.1	31
3	-	1.1	6.7	5.6	17.8	0.3	-	31
4	-	1.1	6.7	5.6	17.8	0.3	-	31
5	-	-	6.7	5.6	17.8	0.3	-	30
Subtot Yr 1 - 5	-	4	33	28	89	1	0	156
6 - 10	-	-	33	28	55.6	1	0	118
Total Yr 1 - 10	-	4	67	56	144	3	0	274

Note: Assumes 180 days of silviculture work = 1 job (Source: Jobs and Timber Accord)

Long term *employment associated with improved quality and quantity of the timber resource*[1]

Decade	Harvest Increment ('000 m3)	Incremental Jobs per year by decade TSA[2]	Prov[3]	Total by decade TSA	Prov
1	140	27	199	266	1,987
2	126	24	179	239	1,788
3	113	22	161	215	1,609
4	112	21	159	213	1,592
5	137	26	195	260	1,945
6	137	26	194	260	1,943
7	137	26	194	260	1,943
8	137	26	194	260	1,943
9	137	26	194	260	1,943
10	137	26	194	260	1,943
11	137	26	194	260	1,943
12	137	26	194	260	1,943
13	137	26	194	260	1,943
14	137	26	194	260	1,943
15	137	26	194	260	1,943
16	193	37	273	366	2,734
17	249	47	354	474	3,540
18	249	47	354	474	3,540
19	249	47	354	474	3,540
20	249	47	354	474	3,540
21	249	47	354	474	3,540
22	249	47	354	474	3,540
23	249	47	354	474	3,540
24	249	47	354	474	3,540
25	249	47	354	474	3,540
Total				8,422	62,941

Notes

1 Assumes continuation of on the incremental silviclture program beyond the first 10 years, in accordance with the strategy. The total harvest increment is associated with all the silvicultural practices documented in the "Opportunities" section and is only partly attributable to spacing and fertilization practices. Some of the increase may be associated with pre-free growing silviculture that was not current practice at the time of TSR1.

2 Assumes 0.19 TSA level harvesting and processing jobs (PYs) per 1000 cubic metre (Source: Kingcome SEA)

3 Assumes 1.42 Provincial level harvesting and processing jobs (PYs) per 1000 cubic metre (Source: Kingcome SEA)

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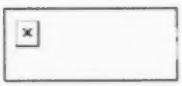
Canadian Forest Products Ltd.

TFL 37

Incremental Silviculture Strategy

Prepared by



Canadian Forest Products Ltd.
Englewood Logging Division

For

Ministry of Forests
Port McNeill Forest District
Vancouver Forest Region

August 9, 2005

Basic Data

Following is the basic data as outlined in TFL 37 Management Plan 8 recently approved by the Ministry of Forests.

Land Area

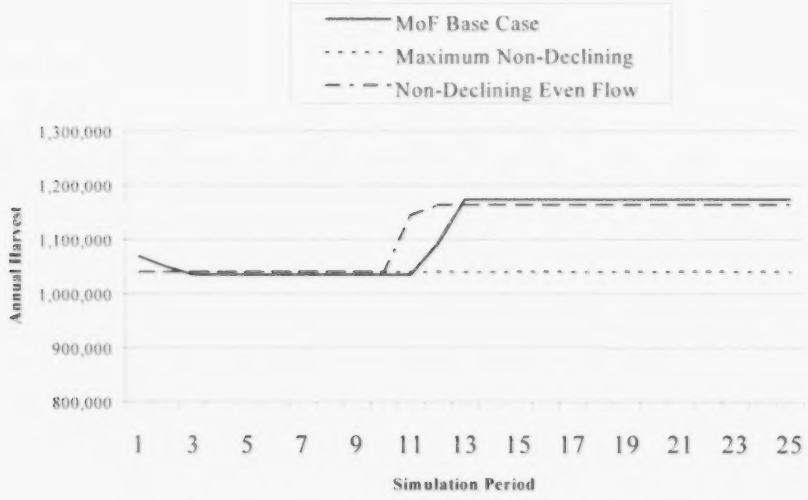
TFL 37 covers approximately 188,745 hectares on Northern Vancouver Island, of which 54% are considered within the net operable landbase for the long term. Schedule A lands within TFL 37 amount to 25,642 hectares (14%), including 4,725 hectares (2.5%) of private land and 20,917 hectares (11%) of private timber in Timber Licences (TLs).

AAC

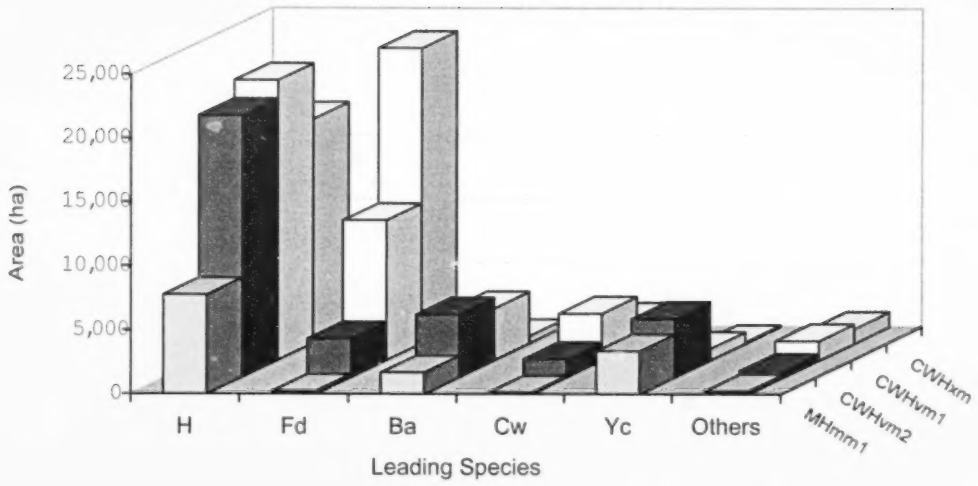
The current AAC is 1,068,000 m^3 per year, under current management and the existing timber harvesting landbase for TFL 37.

Harvest Forecast

Draft harvest forecast based on most recent timber supply analysis.

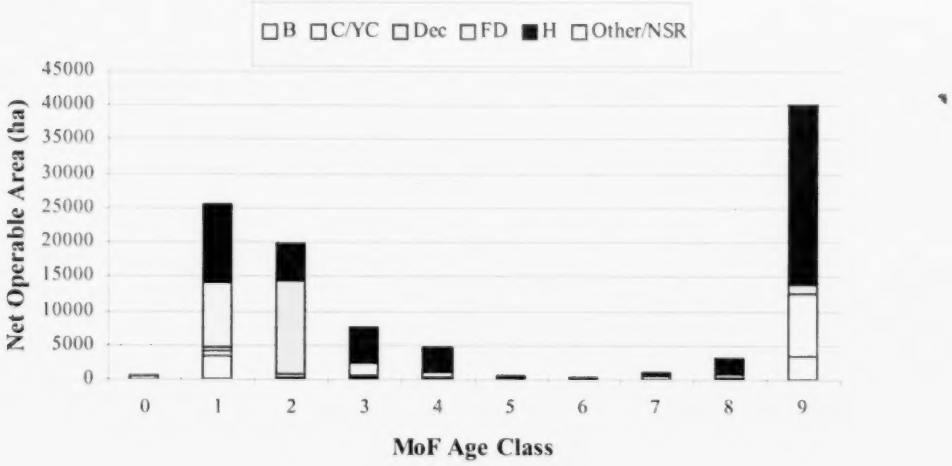


Site Types

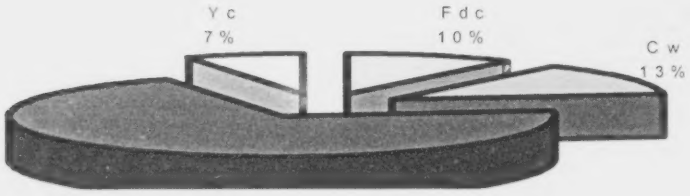


Age Class

Current Age Class Structure for TFL 37.



Current Species Distribution: Figure 13 - See Canfors original document



Issues

The following comments and sensitivity analysis is taken from the draft timber supply analysis report for TFL 37.

Harvest Schedule

In the MOF Base Case the current AAC (1,068,000 m^3) is maintained for one decade with minor declines of 1.8% in year 11 and 1.4% in year 21. After year 110 the harvest rate rises considerably to 1,172,100 m^3 for the remainder of the 250-year planning horizon.

Timber Availability

The existing inventory of mature timber on TFL 37 is approximately 40 million cubic metres. Short term harvesting utilises this inventory until existing and future managed stands become available. The key factors influencing the short-term harvest rate are:

1. The amount of mature timber on the TFL.
2. The timing of the availability of managed stands for harvest.

The critical period for determining the short-term harvest level occurs 50 to 70 years into the future at which time managed stands are required to make up a significant portion of the annual harvest.

Sensitivity Analysis

Adding Uneconomic Stands

Adding 3,169ha of stands classified as uneconomic allows the current AAC to be maintained for 10 years longer than in the MoF Base Case. There is still a required drop of approximately 1.5 percent during the same mid-term period until year 110.

Removing Technically Inoperable Areas

Excluding technically inoperable areas, 6,998ha (7%) of the net operable forest, results in declines throughout the planning horizon. In this sensitivity a 10% drop in harvest rate is required after maintaining the current AAC for 10 years. The long-term rate is approximately 4% lower than in the MoF Base Case. This indicates that the sites occupied by technically unconventional areas are of lower productivity on average than the stands remaining in the net operable landbase.

Removing Marginally Economic Areas
In this simulation 8,493ha of mature timber designated as marginally economic are removed from the timber harvest landbase. The current AAC cannot be maintained in this sensitivity without having a more noticeable reduction in the mid-term harvest level. Therefore a drop of approximately 1.5% is required in the first decade of the simulation with a further drop of 10% to the mid-term level.

Forest Cover
Forest cover requirements related to REA disturbance and green-up do not significantly constrain the harvest schedule at any time during the planning horizon. Only in a few cases does the disturbance level reach the maximum permitted. The Woss-Zeballos LIA (REA 54) and Tsitika GFA (REA 61) reach maximum disturbance limits during periods 3 and 4. Other smaller REAs reach maximum disturbance limits on a very infrequent basis, but these areas only make up a very small component of the timber harvesting landbase.

Growth and Yield
Any change in the time required for managed stands to reach minimum harvest age results in a modified harvest schedule. Similarly, adjusting managed stand volumes changes the harvest level developed in the MOF Base Case.

Sensitivity Analysis

Changes in Regeneration Delay
Reducing regeneration delay to zero makes a minor improvement in the harvest schedule.
Alternatively, increases to regeneration delay result in decreased harvest rates. An increase to two years causes a mid-term reduction of approximately 1.5 percent compared to the MOF Base Case. There is less than a 1 percent difference in the long-term harvest rate. Increasing regeneration delay impacts negatively on the harvest for two reasons:

1. Areas take longer to reach minimum harvest age.
2. Harvested areas take longer to reach minimum green-up height.

Changes in MSYT Minimum Harvest Age
Increasing managed stand yield table (MSYT) minimum harvest age by 10 years has a more significant impact on the harvest schedule compared with increased regeneration delays. The MoF Base Case initial harvest rate of 1,068,000m^3/year cannot be

sustained in this scenario without having a significant drop in harvest after year 10. The short and mid-term harvest is 3 – 13 percent below that of the MOF Base Case. There is virtually no difference in the long-term harvest between this scenario and the MOF Base Case. This is because not all stands are harvested as soon as they reach minimum harvest age in the later decades of the simulation. In the short and mid-term, managed stands are harvested as soon as they become merchantable in both simulations.

Reducing MSYT minimum harvest age by 10 years improves the short and mid-term harvest levels by as much as 5 percent. It is important to note that there is no mid-term decline in this scenario compared with the MOF Base Case. In addition, the rise to the long-term harvest level occurs 20 years earlier in this scenario. The long-term harvest rate is slightly lower than in the MoF Base Case because the harvested stands are providing less volume at minimum harvest age. Harvesting of managed stands begins in year 51, as in the MOF Base Case. However, 7,130,000 m^3 of managed stand volume are harvested between years 51 and 60 in this sensitivity compared to 4,768,000 m^3 in the MOF Base Case during the same decade. The Products-Based Silviculture option examines MSYT minimum harvest ages that are likely to be reduced in future to meet log product objectives.

Changes in Managed Stand Yield Table Volume

Reducing managed stand volumes by 10% does not significantly impact the short-term harvest rate until year 21. At that point the harvest is approximately 7% below that of the MoF Base Case. Although volumes are reduced the minimum harvest ages were not changed from the MoF Base Case. Therefore the harvest reduction is not as immediate or significant as increasing minimum harvest age for these stands. The long-term harvest rate is 10% below that of the MoF Base Case, equivalent to the drop in volume for long-term stands.

Increasing managed stands volumes by 10 percent improves the harvest rate by 3 percent in the mid-term and 10 percent in the long-term. The full impact of improving the yields from these stands is realised in this scenario. Figure 6.8 illustrates the harvest rate over time for some of the growth and yield sensitivity runs.

Management Considerations
Management considerations include landscape level biodiversity, wildlife management and inclusion of the 20-Year Plan.

Sensitivity Analysis

Changes in Disturbance and Green-up
In the Increase Maximum Disturbance scenario, REA disturbance was increased to a "3-pass" approach for most areas (maximum 33% < 3 metres) or up one level for visually sensitive areas (visual 1 to visual 2, etc.). There was virtually no difference in the periodic harvest rate (< 0.5%) compared with the MoF Base Case at any time Similarly, decreasing the maximum disturbance limit to simulate a "5-pass" system (maximum 20% < 3 metres) or increasing visually sensitive areas (visual 2 to visual 1 etc.) there was less than 1% difference in the harvest rate developed for the MoF Base Case. These results confirm that maximum disturbance is not a crucial element in determining the harvest potential from TFL 37.
A number of alternative green-up height requirements were assigned to the Nimpkish HIA and the Tsitika and Woss-Vernon GFAs for this series of analyses. As noted for the maximum disturbance adjustments, these changes to green-up height had no impact on the harvest rate at any time during the planning horizon compared to the MoF Base Case. This is because managed stands achieve green-up in a short time (i.e. many in less than 10 years) because of the high productivity of the landbase. More important is the timing of managed stands reaching minimum harvest age. It is expected that green-up on the Nimpkish HIA will be lower than 3.0m and this will provide and improved harvest potential for the TFL. This is also noted in the 20-Year Spatial Analysis scenario.

Sensitivity to Incorporating the 20 Year Plan
As an alternative to the typical 20-year plans included in management plan submissions a spatial timber supply analysis was conducted for TFL 37. In addition to the landbase netdowns, growth and yield assumptions and management considerations included for the MoF Base Case option, cutblocks were identified and included in the landbase. The majority of the cutblocks were designed by Canfor engineers and covered the mature and older immature stands. Additional cutblocks were designed in the GIS environment based on similar age categories. These cutblocks were then added to the analysis database and allowed cutblock adjacency and silviculture green-up rules to be included in analysis simulation.

The spatial analysis is not intended to represent an operational plan but it does provide one possible solution to locating the harvest on the ground. The results provide an important link between the harvest schedule developed in the non-spatial analyses and operational planning which requires specific harvest locations on an annual basis. Results of the 20-Year Spatial Analysis are then mapped to identify which cutblocks are harvested during each 5-year period of the simulation. Note that 5-year simulation

periods were used in the 20-Year Spatial Analysis. The total planning horizon was 20 years. The results indicate that the initial harvest level of 1,068,000 m^3/year (the current TFL 37 AAC) developed for the MoF Base Case non-spatial analysis option can be carried for at least 5 years in all of the 20-Year Analysis scenarios. ***A reduction of 4.5 percent between the first and second periods in the MOF Base Case spatial analysis is required to meet the 3.0m silviculture green-up requirements.*** All other forest cover requirements are met during all periods of the spatial analyses as they were in the non-spatial analysis.

Silviculture green-up is a key issue in developing the short-term harvest rate on TFL 37. This was not clearly identified in the non-spatial analysis because of the model's ability to harvest small forest stands (as small as 0.25ha) compared with the larger units selected for harvest in the spatial analysis.

Reducing silviculture green-up in the Nimpkish HIA to 2.25m allows the non-spatial MoF Base Case harvest schedule to be carried for the entire 20 years of the planning horizon. Similarly, reducing silviculture green-up by approximately one year in the Enhanced Green-up scenario allows the harvest schedule to match that of the MoF Base Case non-spatial analysis.

Incremental Silviculture History

Stand Tending

Stand tending on the TFL has included spacing, commercial thinning (CT), fertilization, conifer release, and pruning. Juvenile spacing and fertilization assumptions were integrated into the most recent timber supply analysis. Table 9 outlines incremental silviculture treatments back to 1970.

Table 9. Incremental Silviculture Summary 1970 to 1997

Year	Juvenile Space (ha)	Prune (ha)	Fertilise (ha)	Commercial Thinning (m^3)	Commercial Thinning (ha)	Residual Falling (ha)	Site Conversion (ha)	Conifer Release (ha)
1970								
1971							92	
1972								
1973								
1974								
1975								
1976								
1977	9							
1978	42		15					
1979	168		383					
1980	842		740		15			42
1981	983	20	965				40	72
1982	1,726	65	1,465				13	193
1983	937	112	687				139	51
1984	400	262					50	

Year	Juvenile Space (ha)	Prune (ha)	Fertilise (ha)	Commercial Thinning (m^3)	Commercial Thinning (ha)	Residual Falling (ha)	Site Conversion (ha)	Conifer Release (ha)
1985	389	139		724	8		45	
1986	361	78		721	4		27	
1987	520	53						62
1988	280	48	60	1,110	9	740		
1989	409	49	184	7,986	55	606	6	
1990	408	46	1,515	5,301	35	526	8	
1991	1,177	43		11,902	74	494		
1992	148	13	135	8,567	80	275		
1993	312	9		8,567	108			
1994	672	127	619	12,800	89	340		
1995	530	160	323	12,228	7			
1996	160	13	305	6,386	37	400		
1997	363	191	319	9099	56			
1998	256	133						
Totals	10,836	1,428	7,715	85,391	648	3,381	420	
Annual Average	542	90	406	7116	54			

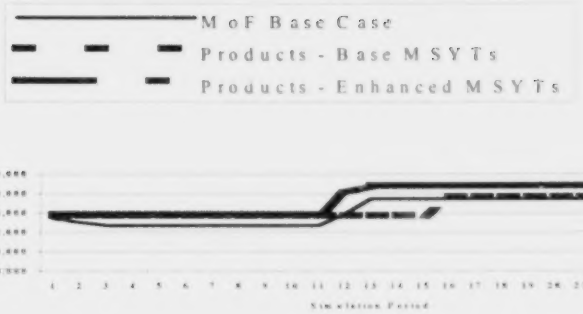
Opportunities to Increase Timber Supply

Products Based Minimum Harvest Ages

The Enhanced Silviculture (tree improvement) MSYTs provide higher volumes for future MSYTs and therefore the overall harvest rate is higher in this scenario. In some situations reduced MSYT minimum harvest ages can result in decreased long-term harvest rates because the volumes provided at younger ages are insufficient to support the harvest target. The productive capacity of the landbase is therefore not achieving its potential. This is not the case for the Products-Based Silviculture scenarios as revisions to the minimum harvest ages were not great and forest cover disturbance is not constraining.

Products Based MSYTs

The positive results of adjusting minimum harvest ages are clearly demonstrated in the two Products-Based Silviculture option scenarios. Future MSYT minimum harvest ages were reduced between 5 and 10 years for many of the MSYTs. The additional volume available in the short-term is due to managed stands becoming available for harvest earlier during the critical period when the existing mature inventory is at a low point. Long-term harvest levels are also improved because stands reach merchantable age in less time.



Products Based Enhanced Silviculture (Tree Improvement) MSYTs

The Enhanced Silviculture MSYTs incorporate second generation tree improvement and provide greater volumes therefore the overall harvest rate is higher in this scenario. In some situations reduced MSYT minimum harvest ages can result in decreased long-term harvest rates because the volumes provided at younger ages are insufficient to support the harvest target. The productive capacity of the landbase is therefore not achieving its potential. This is not the case for the Products-Based Silviculture scenarios as revisions to the minimum harvest ages were not great and forest cover disturbance is not constraining.

Products Based Harvest Flow

Enhanced Silviculture

The timber supply impacts of enhancing the level of incremental silviculture on managed stands were reviewed in this option. Canfor currently has an extensive program of spacing, fertilization, first generation seed orchards and commercial thinning. Gains from second-generation tree improvement, spacing and fertilization were evaluated in this set of analyses. A new set of managed stand yield tables incorporating gains related to these silviculture programs was developed for this option.

Additional Tree Improvement

Estimates associated with improvements from second-generation seed orchard planting stock are included in this scenario. ***The analysis results show that short-term gains of about 2% are possible, while the long-term harvest level is increased approximately 8% over the MOF Base Case.*** The increase to the long-term harvest rate occurs in year 101 in this scenario compared to year 111 in the MOF Base Case. Minimum harvest ages for the revised MSYT are only about three years less in this scenario compared with the MOF Base Case. In the long-term as the inventory of mature managed stands rises, the harvest increases to take full advantage of the enhanced productivity associated with tree improvement.

Tree Improvement plus Spacing

Similar gains are noted in the long-term for this scenario as were described for the Additional Tree Improvement scenario, approximately 8% above the MOF Base Case. However in the short-term the harvest level is slightly lower (1%) compared with the MOF Base Case. This is a result of older minimum harvest ages for the managed stands that include spacing programs. Minimum harvest ages were based on culmination of MAI for this scenario.

Tree Improvement plus Fertilization

Comparable short and long-term gains to those in the Additional Tree Improvement scenario are noted for this scenario, approximately 8 percent above the MOF Base. Very few stands were assigned to fertilization yield tables in this scenario because of limitations within the growth and yield models used to develop the tables. Some adjusting of SI50 values was necessary to develop the yield tables, which resulted in less definitive results. In addition, areas with SI50 of 35m or more are not expected to show any additional volume gains from fertilization. ***Long term research results indicate that multiple fertilization treatments result in significant increases in merchantable volume over a rotation. Weetman et al (1997) report that Fd stands fertilized on 8 year intervals over an 80 year rotation will yield a 13 percent increase in merchantable volume and will provide a 7 percent return on invested funds.***

Tree Improvement plus Spacing plus Fertilization

The harvest schedule developed for this scenario was virtually the same as the MOF Base Case up to year 100 when the increase to the long-term harvest rate commences. As with the other two scenarios in this option, this increase takes place one decade earlier than in the MOF Base Case because of the improved productivity associated with the enhanced MSYTs. The harvest rate up to year 100 is slightly lower than the MOF Base Case, as noted for the Tree Improvement plus Spacing scenario. Again, this is due to the older minimum harvest ages associated with the MSYTs that include spacing. Figure 9 provides a graphic summary of the harvest schedules for the Enhanced Silviculture option.

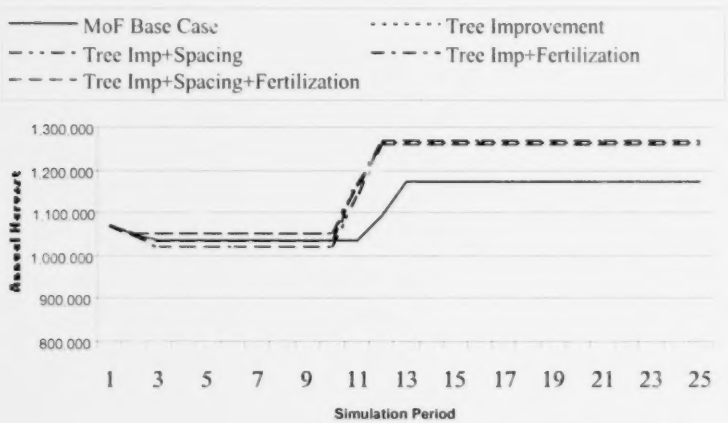


Figure 9 Enhanced Silviculture Harvest Flow

Note that increases in available volume in the various scenarios illustrated in Figure 9 are due to tree improvement and fertilization.

Potential Strategies by Response Time Frame

The response time frame is the period in which the anticipated result is expected, not the period in which the actions must commence. Potential Strategies are outlined in Table 10

Table 10 Potential Strategy by Time Frame

Response Time Frame	Strategy/Action	Anticipated Result
Short Term (1 –20 yrs)	1.Reduce time to 3m greenup by at least one year. (Currently spatial constraints result in a reduction in harvest of 4.5% in the short term) This would be accomplished by increased use of: • Large planting stock at higher densities. • Time of planting fertilization. • Aggressive brush control and animal browse protection. The above treatments are a part of our basic silviculture program, however opportunities exist to increase levels in investment. These treatments are not currently eligible for FRBC Enhanced Forestry funding	Maintain MoF base case harvest level.
Mid Term (21 – 150 yrs)	1. Increase investment in second-generation seed orchards. With sufficient investment, all planting stock will originate from second generation Class A seed. 2. Increase levels of aerial fertilization. Treat all spaced and pruned stands plus selected Fdc leading stands on 8 year intervals (1100+ ha per year)	1. Increase harvest level by 2%. (20,000 m^3) 2. Increase stand yields by 13% on treated stands. (Weetman et al –1997)
Long Term (151+ yrs)	1.Increase investment in second generation seed orchards. By year 20 all planting stock is expected to originate from second generation Class A seed 2. Increase levels of aerial fertilization. (1100 - 2000 ha per year).	1. Increase harvest level by 8%. The increase to long term actually occurs in year 101 rather than 111 in base case. 2. Increase stand yields by 13%

The timber supply analysis indicates that the greatest opportunity for increasing timber supply across all time frames exists by ***increasing investment in tree improvement and multiple fertilization treatments (time of planting and intervals of 8 years).***

Opportunities to Improve Timber Quality

Product Objectives

The following section on product objectives is taken from Management Plan 8 for the TFL.

Table 11 Product attributes for future managed stands

	Product Attributes

	Butt Diameter Range (cm)	Max Knot Size (cm)	Max Taper (cm/ 3m)	Minimum Length (m)	General Description
Premium	60 +	5.0	2.5	5.0	Large, clean sawlogs –dominant component of stands. Small knots and minimum taper. Pruned Fd and Hw unless knots will meet specification.
Standard	40 – 59	10.0	2.5	5.0	Logs too small or too rough to meet Premium. Other possible sorts include Cw poles and house/cabin logs.
Gang	25 – 39	10.0	2.5	5.0	Smaller, pole-sized material suitable for peeling or sawing.
Utility	0 – 24			3.0	Small material or rough large pieces unsuitable for sawlogs.

The fundamental component of our product strategy is the link between stand-level objectives and our forest estate model. Stand projection data used in the timber supply analysis was derived by grouping each BEC subzone and site series within TFL 37 into analysis units. The resultant yield tables provided additional stand and stock tables to explore our product strategy.
Tables 4 through 7 describe the product targets established for each BEC subzone and site series within TFL 37. These product targets consider our basic and incremental silviculture strategies, as well as the corresponding stand projection data used in the timber supply analysis. Our objective was to specify minimum harvest ages required to produce the desired attributes. The following approach was used:

- Select species that maximise yields while giving due consideration to unique species (Cw, Yc, and Pw) where possible and ecologically suitable.
- Set minimum volume per hectare limits that provide a reasonable expectation of economical harvesting operations.
- Set piece size targets. Table 11 provides a description of proposed second growth log grades. Butt diameters are used as TIPSY presents only DBH in output.
- Set minimum piece size targets for each site series (Tables 12 to 15). Dimensions chosen allow for a wide variety of potential products without the need to delay rotations beyond MAI culmination on the majority of our sites.

Table 12 MHmm1 Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Gang	30	67	398	130	Hw/Hm (30) Ba (44) Yc (26)
01p	Gang	30	67	398	130	Hw/Hm (28) Ba (42) Yc (30)
03	Gang	30	67	398	130	Hw/Hm (24) Ba (44) Yc (32)
05	Gang	30	67	386	110	Hw/Hm (22) Ba (38) Yc (40)
07	Gang	35	75	350	125	Hw/Hm (24) Ba (30) Yc (46)

Table 13 CWHvm2 Product Strategy

	Product Targets

	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard	45	33	750	70	Hw (60) Ba (21) Yc (19)
01s	Gang	35	67	640	85	Hw (65) Ba (8) Yc (21) Cw (6)
01p	Gang	35	67	663	95	Hw (63) Ba (8) Yc (21) Cw (8)
03	Gang	35	75	767	95	Fdc (20) Cw (41) Hw (38) Ba (1)
04	Standard	45	33	668	75	Hw (74) Yc (26)
05	Gang	35	75	767	95	Ba (56) Yc (30) Hw (14)
06	Gang	35	75	745	95	Ba (22) Yc (39) Hw (39)
06s	Gang	30	75	455	125	Hw (46) Ba (12) Yc (38) Cw (4)
06p	Gang	30	75	455	125	Hw (45) Ba (12) Yc (39) Cw (4)
07	Gang	35	75	751	85	Ba (52) Yc (30) Hw (18)
09	Standard	45	50	617	100	Cw (38) Yc (44) Hw (18)
11	Gang	35	75	414	130	Cw (42) Yc (48) Hw (10)

Table 14 CWHvm1 Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard/Premium	45	50	816	60	Fdc(71) Hw(19) Cw (10)
01s	Gang	30	67	372	130	Hw (81) Cw (18) Ba (1)
01p	Standard	45	33	715	70	Hw (82) Cw (18)
03	Standard	45	33	692	55	Fdc(66) Hw(19) Cw (15)
04	Standard	45	50	708	80	Fdc(66) Hw(19) Cw (15)
05	Standard/Premium	45	67	959	55	Hw (56) Cw (15) Ba (29)
06	Standard	45	50	877	65	Hw (56) Cw (22) Ba (22)
06s	Standard	45	50	350	120	Hw (69) Cw (16) Ba (15)
06p	Gang	35	67	707	90	Hw (69) Cw (22) Ba (9)
07	Standard/Premium	45	50	906	80	Hw (38) Cw (40) Ba (22)
09	Standard/Premium	45	50	890	70	Hw (35) Cw (39) Ba (26)
12	Gang	35	75	418	130	Cw (40) Yc (40) Hw (19) Ba (1)
14	Standard	45	67	653	80	Cw (86) Hw (13) Ba (1)

Table 15 CWHxm Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard/Premium	45	67	949	65	Fdc (64) Cw (11) Hw (25)
01p	Standard	45	33	640	65	Fdc (62) Cw (15) Hw (23)
03	Standard	45	50	756	70	Fdc (81) Cw (14) Hw (5)
05	Premium/Standard	45	67	884	50	Fdc (70) Cw (22) Hw (8)
06	Standard	45	33	780	70	Hw (70) Cw (30)
06p	Gang	35	75	813	100	Fdc (2) Cw (30) Hw (68)
07	Premium/Standard	45	67	876	55	Fdc (67) Cw (27) Hw (6)
08	Premium/Standard	45	67	961	50	Fdc (69) Cw (26) Hw (5)
12	Gang	35	67	762	75	Cw (81) Hw (19)

Each site series has a proposed product, minimum DBH, percent of total volume and minimum total volume requirements. All criteria must be met before the stand is harvested in the forest estate model. For example, for the CWHxm 01 site series, two thirds of the stand must be at least 45cm and net volume must be 949 m^3/hectare before the stand will be cut. Based on our species and site quality assumptions for this site series, this will occur at age 65.

Potential Treatments

The following outlines potential treatments, some of which are ineligible for FRBC Enhanced Forestry funding, (Table 16). Stand selection criteria are outlined in TFL MP 8.

Table 16 Potential Treatments

Treatment	Potential Treatment Regimes	Treatable Area (annual)
High Density Plantations	Manage highly productive sites in the CWHxm and vm1 to high densities to promote rapid crown lift, low taper, and consistent log sizes. This treatment is aimed at reducing knot frequency and size on the dominant component of stands thereby increasing the proportion of premium sawlogs.	350 ha
Pruning	Remove branches on dominant component of stands on our best sites to maintain or increase proportion of premium sawlogs.	100 ha
Juvenile Spacing	Juvenile space to 1000 sph (overstory) and retain understory of 1/3 average stand height to create a two tiered stand. This is designed to ameliorate volume loss, encourage self-pruning, and provide a layer for subsequent commercial thinning from below. Stand level modelling for spacing indicates a reduction in volume at rotation with a higher mean diameter. Product piece size objectives can be met sooner at the cost of a reduced stand volume. Due to model limitations however, volume estimates did not take understory tier and interim commercial thinnings into account.	100 ha

Potential Strategies by Response Time Frame

The response time frame is the period in which the anticipated result is expected, not the period in which the actions must commence. The following is based on timber supply analysis assumptions and FRBC multi year funding levels. This does not include a financial analysis of potential returns/losses resulting from juvenile spacing and pruning expenditures.

Potential Actions to Increase Timber Quality

Response Time Frame	Strategy/Action	Anticipated Result
Short Term (1 - 20 yrs)	None	
Mid Term (21 - 150 yrs)	1. Juvenile space 300 ha. 2. Prune 150 ha.	1. and 2. Maintain historical proportion of premium sawlogs. Reduce proportion of utility grade.
Long Term (151+ yrs)	As above	As above

Timber Quality Forecast Scenarios

This quality scenario is based on the assumptions built into the most recent timber supply analysis. To get a picture of species and grade distributions across the landbase, estimates of expected volumes at product rotation and net operable area were extrapolated into the long term. This provides the species and grade distribution illustrated in Figure 10.

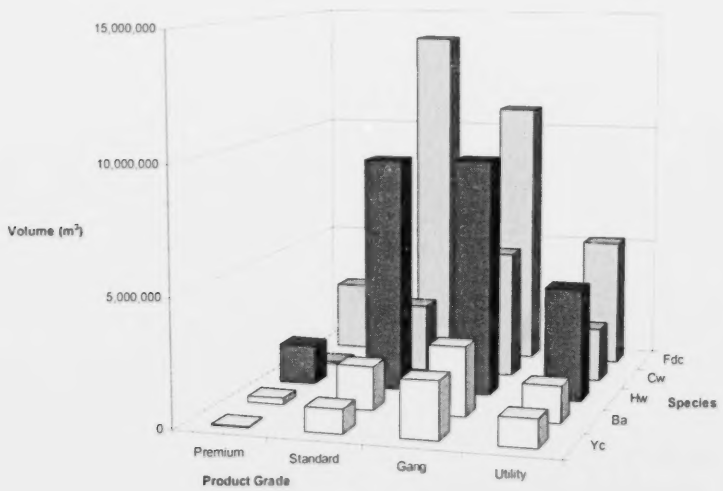


Figure 10 Expected managed stand volumes by species and product (Please see Canfor original document)

Figures 11 and 12 further clarify the picture by expressing expected percent species distribution and percent log grade distribution across the landbase.

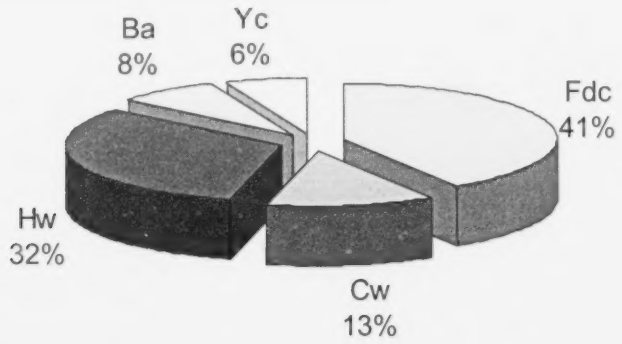


Figure 11: Projected Species Distribution (Please see Canfor original document)

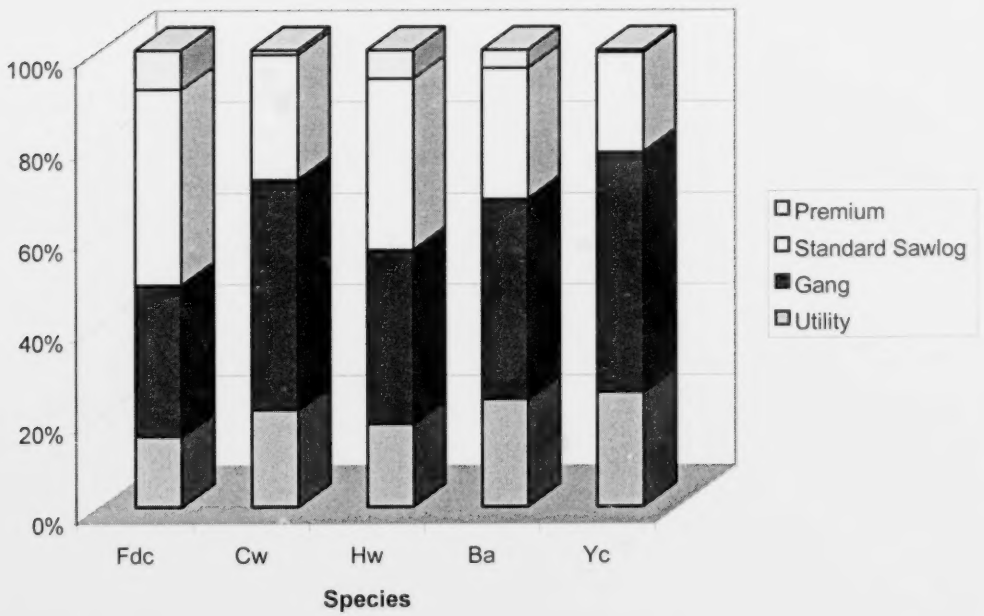


Figure 12: Projected product grade breakdown by species (Please see Canfor original document)

For comparison, a similar illustration of current species and grade profile was completed over a five year period (1993 – 1997). Figure 13 shows current species distribution and Figure 14 illustrates current grade distribution. Note that grade breakdown in Figure 14 is based on current industrial log grade specifications.

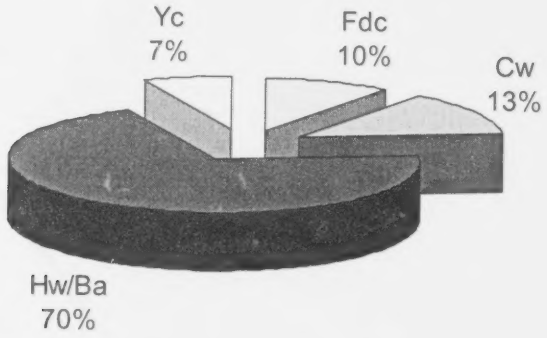


Figure 13: Current species distribution (Please see Canfor original document)

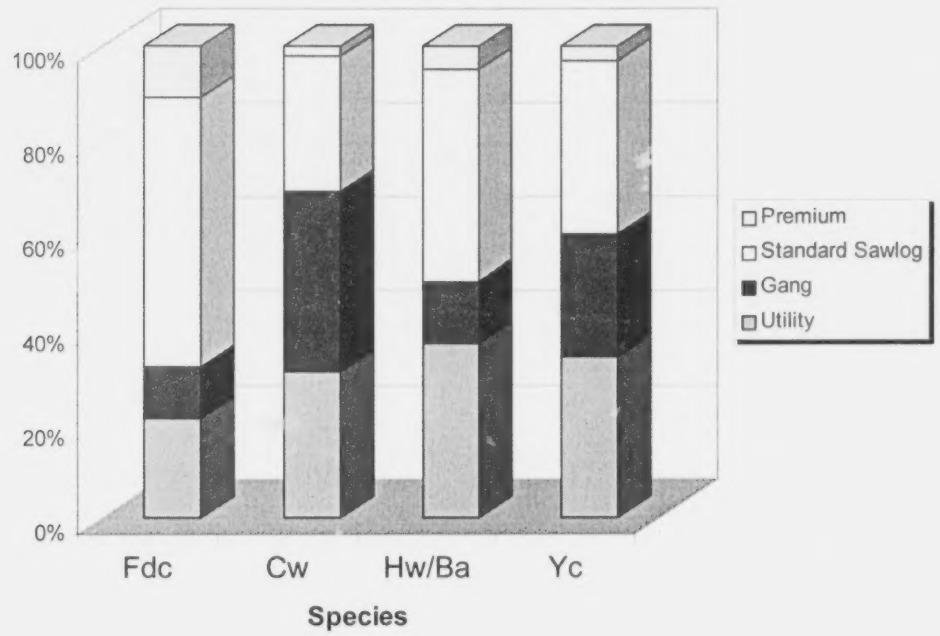


Figure 14 Current product grade distribution

This comparison of future and current species and product grade distributions indicates three major points:

1. Future managed stands will bring about a shift in species dominance from hemlock and balsam to Douglas-fir. Yellow cedar and western red cedar proportions will not change significantly, although management activities will focus on promoting these species where appropriate.
2. While overall piece sizes are smaller, the overall log quality distribution improves as the proportion of utility grade in future managed stands is lower. This is due to the nature of thrifty managed stands to be relatively low in disease and physical defects. Proportion of premium grade logs by species is forecast to be maintained at historical levels (approximately 5%).
3. Projected managed stands will result in a well diversified portfolio of species and grades allowing maximum flexibility in future wood products manufacturing.

This product strategy provides a foundation for the silviculture regimes outlined in the silviculture standards and procedures in Management Plan 8. Minimum harvest ages determined based on product piece size and minimum volume objectives are available at a stand level for operational planning and linked at a forest level for strategic

planning. Accordingly, our silviculture strategies for future managed stands target species selection and stocking levels by site series according to both ecological suitability and future product objectives.

Incremental Silviculture Strategy

Working Targets

Working Target 1 (Quantity)

To sustain an annual harvest level as high as the current AAC of 1,068,000m^3 in the short term, increase to 1,086,100 m^3 in the mid term and finally increasing to a long term harvest of 1,182,500. This will require a combination of silviculture treatments which includes aggressive basic reforestation, increased investment in tree improvement and fertilization and harvest ages based on product targets. *Note: Harvest levels suggested here are based on potential opportunities identified in sensitivity analysis for the TFL Management Plan and are currently not approved by the Chief Forester.*

Working Target 2 (Quality)

To produce a product profile by species as outlined in Figure 12.

Silviculture Strategies

As per Potential Strategies by Response Time Frame.

Product Objectives

As per Product Objectives.

References

Management Plan 8 for Tree Farm License 37 - Canadian Forest Products Ltd. 1998.

TFL 37 Annual Report of Operations, Canadian Forest Products Ltd., 1961 to 1998.

Ten –Year Growth Response of Coastal Douglas-fir on Vancouver Island to N and S Fertilization in an Optimum Nutrition Trial. G.F. Weetman, C.E. Prescott, F. L. Kohlberger, R.M. Fournier in: Canadian Journal of Forest Research - September 1997.

INTERFOR

Incremental Silviculture Strategy
TFLs 10, 38, 45, 54

1:07 PM August 9, 2005

Introduction

An incremental silviculture strategy for Interfor's four Tree Farm Licences (TFLs 10, 38, 45, and 54) is part of a company vision to successfully integrate environmental, economic and social considerations while maintaining or enhancing the forest's timber producing capabilities.

The following are the fundamental management objectives for silviculture on Interfor's TFLs:

Silviculture Program:

Maintain a silviculture program that will ensure all harvested areas are reforested promptly, with appropriate species, densities and stock types, and managed to meet government and corporate requirements.

Silviculture Systems:
Examine different silviculture systems to determine and implement the most appropriate forest management activities.

Protection:
Develop and implement appropriate strategies that will protect the forest and minimise losses from fire, insects, disease and wind-throw by harvesting such areas, where appropriate, as they occur.

The objective of the incremental silviculture program for TFLs is to develop strategies that:

Maximise the contributing forest land base;

Maintain accurate inventories and predictions for growth and yield;

Develop inventories aimed at improving the management of non-timber resources;

Optimise components related to timber supply;

Gain public acceptance of TFL goals; and

Invest in forest management activities.

Product Objectives

The primary goal of an incremental silviculture program will be focused on enhancing future harvest opportunities with increased saw-log volume recovery. Forest management activities that will be considered are those that are expected to yield greater volumes of wood with better grades and higher value. Determination of product objectives contributes to this goal and provides objectives for silviculture treatment planning, budgeting and harvest scheduling.

Product objectives are intended to ensure that:

To as great an extent as possible, H and I grade saw-logs, or better, suitable for manufacture of clear, appearance merch, select and structural lumber are produced (with 50 cm ±15 cm average DBH for final harvest and 30 cm ±5 cm average DBH for commercial thinning);

A spectrum of log grades, including clear material will be produced over the long-term to provide opportunity for value added manufacturing;

Rotation ages will dovetail with requirements for other resource values such as visual quality and biological diversity;

Incremental silviculture and commercial thinning opportunities will only be considered when they achieve positive rates of return. Where FRBC or Ministry of Forests is funding incremental silviculture or commercial thinning etc., projects will be considered in light of Ministry of Forests specified discount rates and economic assumptions for calculating rates of return.

The current prevailing log production objective for TFLs is:

Late Seral Stage Forest Product Objectives
Harvest primarily late seral stage forest to produce conifer logs suitable for manufacturing of solid wood products ranging from 'specialty products' through to commodity structural lumber.

Late seral stage timber production will be the primary focus for at least the next 5 to 7 decades. Second growth stands will likely not significantly contribute to the gross harvest until beyond the year 2040

Company wide coastal log production dictates manufacturing facility upgrades and modifications to match the timber resources with customers' lumber requirements.

Second Growth Product Objectives
Species selection will be based on ecological suitability, reliability, productivity and value; and

Where feasible, target stocking levels, rotation ages, and silviculture treatments will be planned to achieve saw-log grade specifications with highest value.

Silviculture Practices

The recent timber supply analysis for each TFL considered options that include current management strategies including application (to varying degrees) of some of the key requirements under the Forest Practices Code, and enhanced forestry opportunities.

In the management plans for TFLs 10, 38, 45, 54 the general recurring theme has been that silviculture management and treatment regimes on TFLs are designed to produce conifer logs suitable for lumber manufacturing at the lowest cost. Interfor is committed to carrying out basic silviculture to support the TFL resource management objectives. Silviculture activities will be conducted in accordance with the *Forest Practices Code of*

British Columbia Act (FPC Act) and associated Regulations. The company's aim is to be guided by future changes to these and other pertinent Acts, Regulations and Standards. Interfor will adjust silviculture strategies to accommodate new objectives and to incorporate new information about the science of silviculture.

As part of enhanced forestry Interfor is committed to pursuing an enhanced silviculture program. The intent is to develop silviculture strategies and treatments that will meet the objectives for enhancing the forest's timber-producing capability, including increased volume, improved quality and higher value. It has been Interfor's intent to evaluate and implement programs that are of incremental value to basic silviculture responsibilities. The program is to be developed together with Forest Renewal BC. Objectives are to:

Maintain a silviculture program that will ensure all harvested areas are reforested and managed to meet government and corporate requirements;

Utilise silviculture systems appropriate for the achievement of forest management objectives;

Protect the forest and minimise losses from fire, insects, disease, wind-throw and other biotic and mechanical factors; and

Convert hardwood stands to coniferous plantations where economically and ecologically justifiable. If hardwoods are the most ecologically suitable species for a given site then hardwood management will be employed. This fibre may be used by Interfor mills or traded for softwood logs.

As some stands will be managed for wildlife, visual or terrain stability objectives and timber production, product objectives require flexibility. The concurrent application of multiple management objectives will affect rotation periods and this will influence stem diameter and stem quality. Stands that have primary management objectives other than timber production will have varying silviculture/harvesting regimes.

Interfor's basic strategy is to establish and manage conifer stands in even-aged silviculture systems utilising regeneration and crop tending regimes that include:

Harvesting to create stand characteristics that may range from commercially thinned to clear-cut openings;

Site preparation of site-specific areas where stocking standards are not achieved;

Planting within one year of harvesting on most areas. Natural regeneration is prescribed on a site specific basis generally on high elevation, north facing cooler aspect, low site blocks;

Brushing of site-specific areas, as early as operationally feasible, where stocking standards are not achieved or when improved crop growth performance is desirable. Brushing may occur at various times until plantation establishment has reached free growing; and

Enhanced silviculture designed to enhance resource values and yields will be carried out in conjunction with funding from FRBC, or similar funding mechanism.

Enhanced Silviculture

As part of the establishment of Resource Management Zones, Interfor has committed to pursuing an enhanced silviculture program, with the intent to meet the objectives for enhancing the forest's timber-producing capability, including increased volume, improved quality, and higher value. Interfor will evaluate and implement programs that are of incremental value to the basic silviculture responsibilities. This program is on going through the implementation of Forest Renewal BC proposals planned for the next five years. Components of this program being considered include the following:

Prompt reforestation with larger sized genetically improved stock, where available - to reduce time to achieve visually effective green-up, allowing for increased operability on visually sensitive areas;

Stand conversion from deciduous to coniferous stand types - to expand the contributing operable land-base;

Use of alternate harvesting methods and alternate silviculture systems - to increase operability in environmentally sensitive areas, buffers, wildlife management zones, and visually sensitive areas;

Growth and yield measurements, particularly those related to site index (SI) - to validate Commercial thinning opportunities - to increase operability on visually sensitive areas, and to optimise timber flow profile;

Pre-commercial thinning activities - to effect piece size and quality;

Spacing and thinning - to effect piece size and quality;

Fertilisation opportunities - to improve yields from managed stands; and

Pruning opportunities - to meet second growth product objectives.

Silviculture prescriptions for activities will be prepared, to meet the management objectives for the TFL. The objective of incremental silviculture is, in general, to accelerate tree growth and to improve the value of the final crop through reducing competition and increasing nutrition. The most common intensive silviculture treatments used for live-crown management are spacing, thinning, fertilisation, and pruning.

Intensive silviculture must consider site quality and the limitations imposed by poor site. All silviculture interventions must be based on economic efficiency, as the potential benefits may not always realised.

There is an optimal combination of stocking density and harvest age, for each species and site, which will produce the highest value combination of volume and quality. Product objectives will be the basis for specific prescriptions. No single prescription can

serve as a general treatment. On each site the objective is to balance the costs of silviculture against increased future value, and to choose the economically optimum rotation age.

TFL Management Plans

Management Plans (MP) for all four TFLs have been submitted since June 1995. Table 17 details the specifics regarding management plan submissions.

	TFL 10	TFL 38	TFL 45	TFL 54
Management Plan	No. 7	No. 8	No. 3	No. 2
Expires	Dec 31, 2000	Dec 31, 2002	Oct 31, 2001	Dec 29, 1999

Table 17: TFL Management Plan status.

One of the primary resultants from the management plan process is the Timber Supply Analysis (TSA). The timber supply analysis forms the basis for a recommended Allowable Annual Cut (AAC) for the term of the MP. The analyses cover several options, including current management, and opportunities associated with proposed enhanced forestry activities.

In the TSA the "Current Management Strategies" option incorporates management practice that is considered to be current on the date of commencement for the preparation of the management plan. As a result, the degree to which each analysis considered some key management standards currently required under the Forest Practices Code, most significantly riparian management and biodiversity requirements, vary.

The "Enhanced Forestry" option focuses analysis on identified opportunities to affect short-term and long-term timber supply. Four basic opportunities have been identified, considered to be 'currently implementable' and applied to the licensee recommendation for harvest flow and AAC. Specifically, site index adjustments, allowance for genetically improved stock, managed stand optimum species selection, and reduced harvest ages on good sites.

Identified opportunities that are considered feasible, pending verification, form a package of consideration for developing a collective strategy for the enhanced forestry program.

A comparison of the conditions applied to the target harvest flow, and recommended AAC, are detailed in Table 18.

CONDITIONS APPLIED TO THE TARGET HARVEST FLOW AND RECOMMENDED AAC	TFL 10	TFL 38	TFL 45	TFL 54
Cruise data available for processing	Y	Y	Y	Y
Standing volume estimate based on . . .	VDYP	Cruise based Average Volume Line	VDYP	VDYP
Managed stand yield curves based on . . .	WinTIPSY	WinTIPSY	TIPSY	TIPSY
Site Index adjustment	+2.6m D-fir +3.8m Cedar +6.8m H/C +5.4m H/Ba +5.4m Ba	+ 0.2m to +7.2m specific to BGC Subzone and spefcies	+6m for Cedar +3m for others	+6m for Cedar +3m for others
Allowance for genetically improved stock	Currently Implementable	Currently Implementable	Currently Implementable	Currently Implementable
Managed stand optimum species selection	Currently Implementable	Currently Implementable	Currently Implementable	Currently Implementable
Reduced harvest ages on good sites	Currently Implementable	Currently Implementable	Currently Implementable	Currently Implementable
Regeneration delay	3 yr – NSR 4 yr – planted 6 yr – natural	2 yr – NSR 2 yr – planted	2 yr – NSR 3 yr – planted 5 yr – natural	1 year
Road Allowance	4% - current 4% - future	4% - current 4% - future	3.6% - current 4% - future	2% - current 2% - future
Landscape level biodiversity	Y	Y	Y	
Forest Ecosystem Networks				Y
Stand level biodiversity	Y	Y		
Riparian management	FPC buffers	FPC buffers	Limited buffers	ESA
Marginal land base included in AAC	No	Y	Y	Y
Net land base (ha)	24 242	36 144	29 131	22 582
Approved AAC (Licensee Accessible Portion)	170 950 (48 903)	250 500 (237 382)	210 000 (199 920)	75 750 (66 759)
Long Run Sustained Yield - Base Case (Enhanced Forestry Option)	110 000 (135 300)	125 000 (172 000)	185 100 (248 100)	136 700 (174 700)

Table 18: Conditions applied to the target harvest flow and recommended AAC.

Sensitivity analysis provides a measure of the upper and lower bound of a "base case" harvest forecast that reflects the uncertainty of assumption made in the base case. The magnitude of the increase and decrease in the sensitivity variable reflects the degree of uncertainty surrounding the assumption associated with the given variable.

The sensitivity analyses highlights the factors that have significant potential impact of short-term and long-term timber supply. As each TFL is sensitive to different factors and to varying degrees, the sensitivity analysis results aid to focus proposed incremental silviculture activities on issues that can be incorporated into the next round of timber supply analysis and can be expected to have quantifiable upward pressures on the AAC.

Most significant issues with AAC sensitivity analysis	Potential AAC Impacts		
TFL 10	Short-term Decades 1-4	Mid-term Decades 5-8	Long-term LRSY
Land base ± 5%	-7% / 0%	-17% / +1%	-5% / +5%
Existing yield estimates ± 10%	-3% / 0%	-8% / +20%	0% / +4%

Regenerated yield estimates (base case vs site index adjustment)	na / 0%	na / +6%	na / +23%
Regeneration delay minus 1 year (base case 4 yrs planted, 6 yrs natural)	0%	0%	0%
Green-up ages ± 2 years	0% / 0%	0% / +6%	0% / 0%
Minimum harvest age ± 10 years	-3% / 0%	-8% / +5%	0% / +<1%
VQO - maximum disturbance	0%	0%	0%
Road allowance	0%	0%	-2%
Old growth retention ± 25% (base case Grizzly Zone-A 75% retention)	0%	0%	-2% / +2%
Stand level biodiversity: yields -2.5%	0%	0%	-3%
TFL 38	Short-term and Mid-term decades 1-8		Long-term LRSY
Land base ± 5%	-5% / +5%		-5% / +5%
Existing yield estimates + 15%	+16%		0%
Regenerated yield estimates (base case vs site index adjustment)	+ 8%		+33%
Regeneration delay ± 1 yrs (base case 2 yrs planted, 2 yrs natural)	0%		0%
Green-up ages ± 2 years	0%		0%
Minimum harvest age ± 10 years	-6% / +6%		0%
VQO - maximum disturbance	-2% / 0%		0%
Road allowance + 1%	-2%		0%
Biodiversity emphasis – intermediate	0%		0%
Genetic improvement +3-5% depending on species	+1%		+1%
Defer harvest in marginal operable area for 20 years	0%		0%
TFL 45	Short-term and Mid-term decades 1-12		Long-term LRSY
Land base ± 5%	Not tested		-5% / +5%
Existing yield estimates ± 10%	-7% / +5%		0% / 0%
Regenerated yield estimates (base case vs site index adjustment)	na / +2 to +18%		na / +5 to +29%
Regeneration delay ± 2 yrs (base case 3 yrs planted, 5 yrs natural)	-4% / +4%		-4% / +3%
Green-up ages ± 2 years	-2% / +3%		-2% / +2%
Minimum harvest age ± 10 years	-7% / +4%		0% / 0%
VQO - maximum disturbance	-10% / +8%		-8% / 8%
Road allowance	0%		-2%
TFL 54	Short-term and Mid-term decades 1-8		Long-term LRSY
Land base ± 5%	-5% / +5%		-5% / +5%
Existing yield estimates ± 10%	-18% / +10%		-6% / 0%
Regenerated yield estimates (base case minus 20% vs SI adjustment)	-5% / +9 to +14%		-16%/ +35 to +51%
Regeneration delay 6 yrs (base case = 1 yr)	-8%		-2%
Green-up ages ± 2 years	-7% / +9%		-1% / +11%
Minimum harvest age ± 10 years	-7% / +7%		-3% / +2%
VQO - maximum disturbance	-6% / +0%		-5% / 0%

Table 19: Significant sensitivity analysis impacts.

Silviculture Systems

The company will examine alternate silviculture systems and different harvesting methods. Key aspects to consider in the application of alternative silviculture systems include:

Silvics;

Ecological suitability and forest health concerns;

Terrain limitations;

Exposure to high wind conditions that increase blow-down concerns;

Worker safety;

Economic feasibility;

Equipment limitations; and

Other resource values (visual, wildlife, etc.).

Interfor will apply a variety of silviculture systems that address the above concerns to meet the objectives for forest management on the TFL. Licensees currently operating in the Vancouver Forest Region are required to harvest some of their blocks using non-clearcut systems. Interfor will use alternative silviculture systems, consistent with District Manager direction or higher level plans, the FPC and the Management Plan. Silviculture system selection will make consideration for the Silvicultural Systems Guidebook.

Alternative silviculture systems will be utilised under special conditions. Typically, an alternate system is used to meet management objectives for visual quality, wildlife habitat or terrain stability. Alternative systems that will be employed include 'strip selection', 'group selection', 'seed tree', and 'shelter-wood'.

Alternate silviculture systems will be used over the next twenty years, however, the type and extent to which any given system will be used is unpredictable. Interfor expects to meet all government policy regarding the use of alternate silviculture systems.

20-Year Plans are prepared to indicate a potential harvest pattern and demonstrate that the recommended harvest level is spatially plausible within the context of current planning, riparian, and biodiversity guidelines. The 20-Year Plans does not attempt to estimate the breakdown of silviculture systems that will be utilised over the twenty year planning horizon.

Silviculture Prescriptions

Silviculture prescriptions (SPs) are prepared for all areas to be harvested and are submitted to the District Manager for approval, in accordance with the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: evaluation of forest health factors; harvesting methods; gully assessments; silviculture systems; silviculture systems in a riparian reserve zone; retention of

streamside trees; soil condition; forest floor reduction and displacement; soil disturbance; excavated or bladed trails; regeneration method; silviculture treatments; and species selection.

SPs are prepared in consideration of the *Site Diagnosis, Tree Species Selection and Slash Burning Guidelines for the Vancouver Region*, *the Guidelines for Preparation of Silviculture Prescriptions for the Vancouver Forest Region*, and the *Silviculture Prescription Guidebook* of the FPC. The objective is to have approved SPs for the first two years of the Forest Development Plan.

Species selection will reference *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region, Land Management Handbook Number 28 1994* and *the Establishment to Free Growing Guidebook - Vancouver Forest Region.*

Site Productivity Reductions

The proportion of productive growing site, permanently converted for access and forest development, will be limited to that compatible with safety and long-term resource management objectives. Area converted to permanent access will be limited to the maximum stated and approved in the SP.

Anticipated, unavoidable losses in productivity attributed to landslides will be fully evaluated with a detailed terrain overview assessment and submitted with the FDP. The risk of landslides is recognised. Risk of landslides will be assessed for impact on resource management objectives, and for significant risk of damage to resource values. The *Operational Planning Regulations* of the FPC Act, requires that the licensee must collect and analyse data, and submit in conjunction with the FDP, assessments in consideration of site and soil conditions; terrain, terrain stability and hazards associated with instability.

If new slides are noted, they are reported to the Forest District (Field Operations Supervisor and/or Engineering Officer) as well as MoELP.

Slides that have a detrimental impact upon the resource management objectives will be evaluated and where appropriate stabilised to:

Control surface erosion by re-vegetation and/or other techniques; and

Re-establish conifer crops.

Other than the reductions in site productivity required for access, management strategies will strive to maintain or enhance site productivity. The *Hazard Assessment Keys For Evaluating Site Sensitivity To Soil Degrading Processes Guidebook* will be considered in the assessment of the inherent sensitivity of a site to the following soil-degrading processes: soil compaction and puddling; soil displacement (including exposure of unfavourable subsoil and slope hydrology changes); forest floor displacement; surface soil erosion (exposed mineral soil); and mass wasting.

Site Preparation

The necessity for, and method of site preparation, is prescribed in the SP through assessment of potential slash loading, planting spot availability, species preference,

regeneration method, biodiversity requirements, and fire and pest risk. The prescription is reassessed and amended if necessary upon post-logging inspection. It should be noted that site preparation treatment(s) may not be of benefit to achieve regeneration on many of the harvested area(s). Therefore, the majority of the areas will receive no treatment.

Site preparation prescriptions will make consideration for the *Site Preparation Guidebook*. Site preparation may occur on individual areas:

Greater than 0.2 ha in area, dispersed throughout the harvest block, and

On roadside patches greater than $50m^2$ area.

As well as achievement of target stocking objectives, site preparation treatments may be carried out as part of integrated vegetation management strategies, or to improve soil or other site conditions for tree growth. These treatments may be considered where compatible with resource management objectives and scheduled in an approved SP.

Most site preparation will be done with machines (excavators), however, other techniques will be employed where appropriate.

Reforestation

Reforestation is accomplished as soon as it is practical following completion of harvest and any necessary site preparation treatments. In accordance with the approved SP the majority of harvested areas will be:

Planted within one year of completion of harvest to minimise regeneration delay. Natural regeneration is prescribed on a site-specific basis. Fill-in planting maybe required to achieve regeneration delay;

Planted to ensure the presence of ecologically suitable and preferred species;

Planted at densities that, along with natural regeneration, will ensure prompt achievement of target stockings standards;

Planted with appropriate sized stock types (in general larger stock types are planted where vegetation competition, climatic conditions and animal browse are problematic);

Planted with a component of genetically improved stock where available; and

Fill-planted within one year of plantation failure, if that occurs.

The *Establishment to Free Growing Guidebook - Vancouver Forest Region*, will be referenced. Exceptions to these stocking standards will be proposed, after assessing the use of alternative silviculture systems, to overcome or reduce the effect of the following:

Colluvial sites (precluding achievement of minimum stocking standards);

Sites with high water table (within 30cm of mean soil surface and restricting productive sites to mounds);

Shallow organic soils over rock or other impermeable layers (Folisols); and

Sites where lower stocking standards are deemed in accordance with wildlife management objectives.

Unique standards for these and other sites will be defined in the SP.

Colluvial sites, sites with high water tables, and sites with folisols will be harvested only if they are capable of sustainable forest management. Where regional stocking standards cannot be achieved, acceptable minimum stocking densities will be proposed similar to those present before harvesting. In some cases, longer than normal regeneration delays will be recommended.

Brushing

Deciduous and brush competition in planted and natural stands will be controlled to allow stands to reach a free-growing condition as prescribed and approved in SPs. Stands are monitored from completion of harvesting to determine the need for brushing treatment.

Interfor will brush where stocking standards cannot be achieved, due to brush competition, or if improved crop growth performance is financially desirable. In most cases, the objective will be to avoid the need to brush by promptly planting suitable stock types. If brushing is required then the methods employed will be manual and/or chemical. The brushing technique used will consider the specific site, stand, social and regulatory conditions.

All stands are monitored, from completion of harvesting, for brushing and weeding treatment. Where alder encroachment, as well as some maple coppicing, is a significant problem on richer, southerly aspect sites. These stands can be effectively weeded by manual and herbicide methods. Any consideration of herbicide use among potential brush control methods will be carefully and thoroughly weighed using the following variables.

The method of brush control, whether manual, mechanical or chemical, is chosen on a site specific basis to provide the most efficient means of achieving the brush control objectives. The following variables are considered in selecting a treatment method for each brush site:

The brush species competing, the present and potential degree of competition, terrain and site conditions;

The effectiveness of different control methods available;

Potential for re-treatments;

The health risks to workers, employees, neighbours, and others;

Risk to wildlife and fish;

Risk to soil and water;

Acceptability of methods to other resource agencies and forest users; and

The cost of effective control by various methods.

Chemical site preparation methods are considered where it is necessary to reduce existing vegetation competition or when planting into established vegetation communities. The commercial herbicides that will be considered are Vision (Glyphosate), and Release (Triclopyr). The proposed use of herbicides will be specified in the Silviculture Prescription. Use of herbicides is regulated under the Pesticide Control Act and Regulations. The Act and regulations are administered under the Pesticide Management Program of MELP. MELP regulates Pesticide Use Permits and their issuance.

Site Rehabilitation

Site rehabilitation opportunities exist for backlog Satisfactorily Restocked stands to improve stocking on sites with less than optimal spacing (i.e. old roads and landings).

The majority of good and medium, low elevation sites now growing cottonwood and alder are best-suited ecologically to those species, and conversion to slower growing, longer rotation coniferous species may only be justifiable where ecologically appropriate. Several cottonwood plantations are located near river areas. These sites are relatively unstable, subject to occasional flooding and river channel change and contain fish spawning and rearing habitat, as well as recreational and wildlife values. Nearly all Cottonwood and Alder mix stands (mature and immature, accessible area only) are alluvial, river flat sites suited to cottonwood or alder as the primary species. As these deciduous species, the majority of which are cottonwood, become merchantable, they may be managed on suitable sites.

Target sites for conversion will make consideration for the type, quantity and distribution of deciduous stands that would be expected under natural disturbance regimes.

Seed Supply

Interfor attempts to have available a five-year or greater supply of seed, except where seed orchard supply is dependable and available, necessary to meet planting stock requirements for TFLs. Genetically improved seed-orchard seed, is obtained whenever it is available. The Interfor is neither an owner nor partner in any seed orchards, and therefore purchases suitable seed from other producers.

Interfor collects, trades, and purchases seeds to ensure adequate supply.

Spacing

Stands are spaced as a part of our basic silviculture obligation as defined by regulation and committed to in the Silviculture Prescription.

The *Spacing Guidebook* is considered in developing site-specific management strategies and prescriptions to accommodate resource management objectives identified in this management plan. The guidebook is not definitive and is deemed to allow reasonable flexibility to vary and adapt juvenile spacing practices to site and stand-specific conditions and to achieve a wide range of forest management objectives.

Stand density plays an important role in the growth function of regenerated stands, and the production of merchantable saw-logs, and is monitored in second growth inventory and regenerated stand assessments. Excessive stand density, which may result in

both depressed stand growth and reduced average stem diameter, is not considered to significantly reduce the Long Run Sustained Yield (LRSY). Average total stocking levels are in the range of 800 to 2,500 stems per hectare, with few stands exceeding 3,000 stems per hectare being considered consistent with the natural stand yield curves used for volume prediction in the yield analysis. Stands of densities exceeding 1,000 stems per hectare may benefit from juvenile spacing to increase the size and uniformity of average stem diameter and decrease time to harvest of these spaced stands.

Stands are also be considered for juvenile spacing where stocking control can be reasonably expected to result in a positive financial return from an earlier harvest of sawlog-sized conifers, or where stocking control is appropriate to achieve other resource management objectives. In addition, social objectives and stands that qualify for incremental funding will be considered for spacing as funding (FRBC) becomes available.

Silviculture Surveys

An appropriate regime of surveys and inspections will be maintained to support the basic silviculture program.

Sites are:

Inspected at harvest completion to identify and prescribe site preparation and planting treatments and to amend the SP, where this is required;

Inspected after site preparation to determine the need for additional treatments and to prescribe planting;

Surveyed during planting to determine quality of plantation and survival chance;

Inspected between the first and second growing seasons after planting to determine the need for additional planting;

Regeneration surveyed before regeneration delay to determine stocking levels, plantation growth rate and species composition;

Inspected at or before the anticipated onset of undesirable levels of vegetation competition;

Surveyed for Free Growing condition; and

Considered for other surveys and inspections as required to manage site conditions and to achieve resource management objectives.

Silviculture surveys are planned in consideration of the *Silviculture Surveys Guidebook*.

Free Growing

A free-growing condition will be achieved on all regenerated stands according to the FPC Act and *Silviculture Practices Regulation* and approved SP. The free growing standards are specified in the approved SP for individual growing sites and stands. Target objectives for free-growing stands will conform to *the Establishment to Free Growing Guidebook - Vancouver Forest Region*. Stocking standards for regenerated

stands, established prior to the FPC or the approval of this management plan, will conform to the approved SP.

Determination of the free-growing condition will be made for each individual stand type and site using the standards and criteria detailed in the approved SP. The determination of free-growing shall include the criteria of size and proximity of crop trees to competing vegetation, and the effects the competing vegetation has on crop tree performance.

Stand Management Prescriptions

The scope and content of Stand Management Prescriptions (SMP) are described in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: evaluation of forest health factors, silviculture systems, species selection, soil disturbance, and silviculture treatments.

An approved SMP is required under the authority of the Forest Practices Code of British Columbia Act, prior to commencement of any silviculture treatment on free growing stands. Stand management prescriptions make consideration for the *Stand Management Prescription Guidebook*. SMPs describe actions to be carried out on a free growing site to:

Ensure that stand management activities are planned and implemented to maintain or enhance the inherent productivity of the site;

Ensure resource values including biological diversity are identified and accommodated; and

Set out a series of stand management activities to produce a stand capable of meeting the stated management objectives.

As TFL management plans include a variety of end-product or stand-use objectives, the primary stand management objective is the production of high value saw-logs, the SMP provides a stand-level action plan for achieving the target stand conditions to meet these management objectives. The SMP provides for setting stand level objectives and identifying the treatments necessary to achieve these objectives.

An SP approves all silviculture activities from pre-harvest of the original stand to free growing of the new stand. Collectively, the SP and SMP provide a stand strategy or full-rotation plan that schedules all silviculture activities required meet specific stand management objectives. The life span of an SMP is from free growing to the time when the next SP is approved. Though an SMP is in force for this period it is not a static document. The SMP may be amended at any time during its life to authorise alternative objectives and treatment(s) for that stand.

The SMP does not have the same legal requirements as the SP, it is expected to be an adaptive document. The SMP carries no obligations to fund or implement the prescription. However, if an activity is undertaken, the management objectives and the minimum treatment standards specified in the SMP must be adhered to. If there is more than one activity scheduled in an SMP and one or more of the prescribed

activities have already been carried out, there is no legal obligation to carry out the remaining activities in the SMP.

If no activities are planned for the site after free growing, no SMP is required.

Pruning

Stands will be considered for pruning where stand manipulation can be reasonably expected to result in a positive financial return from a harvest of higher quality saw-log-sized conifers, or where stand manipulation is appropriate to achieve other resource management objectives (i.e. wildlife habitat). In addition, stands that qualify for incremental funding will be considered for pruning, as funding (FRBC) becomes available.

Planning and implementation of pruning activities will consider direction and standards recommended in the *Pruning Guidebook*.

Commercial Thinning

Commercial thinning is considered to satisfy various resource management objectives, including product objectives. Commercial thinning may be used in order to harvest wood from a hillside where protection of scenic values is the primary management objective. Other resource objectives that may dictate the use of commercial thinning are wildlife habitat, biodiversity emphasis, terrain stability, water quality or social values.

Forest Renewal BC

Potential FRBC project proposals to deal with various aspects of forest management including projects relating to:

Watershed
Road deactivation and rehabilitation of disturbed areas;

Restoration
Enhancement of fisheries and wildlife habitat;

Inventories
Addressing site productivity assignments;

Terrestrial Ecosystem Mapping;

Non-timber resources such as fisheries and wildlife;

Up-grading the current timber inventory;

Forestry
Experimenting with alternate silviculture systems in original forest and second growth stands;

Expanding the productive land-base including harvesting of sensitive areas and low site stands;

A variety of silviculture treatments such as spacing;

Education

Training for company staff, contract crews, local and First Nation communities.

Resource Management Plan for
MacMillan Bloedel Limited
TFL 39, Blocks 3 & 4 and Associated Tenures,
Port McNeill Forest District

Basic Data

Basic data on area, harvest levels, and age class distributions are found in Management Plan #7 for TFL 39. Block 3 is located on the islands and mainland areas near Port McNeill, and Block 4 is in the Benson River drainage. The timber harvesting landbase for the two blocks is 49,666 hectares, and the AAC is 415,000 cubic metres. The total AAC with the associated tenures is approximately 750,000 cubic metres (includes Doc Creek operation in Block 7).

Sustainable Harvest Program

Activity tables A-F appendix IV, attached, summarize the allocation of resources as requested by L. Sigurdson on July 13, 1999.

Priorities and Rationales

The main priorities for allocating resources to activities are:

- Achieve a reasonable return on investment.
- Provide local jobs.
- Maintain commitments to First Nations Partnerships.
- Ensure free-growing status and rapid green-up.
- Ensure that adequate stand productivity is realized.
- Ensure timber availability.
- Provide habitat, and restore structural diversity over the landscape.

Surveys and brushing of backlog areas receive the highest priority. Surveys of backlog areas determine stocking; stocking is vital for inventory projections and for identifying required treatments and outstanding obligations. Brushing backlog areas protects previous stand establishment investments, and mitigates the negative effects of

vegetative competition on stand productivity. Brushing also provides an opportunity to provide employment for First Nations Partnerships.

Planting failed backlog areas to ensure full stocking is also a high priority, although the area requiring treatment is generally small.

Fertilization is a high priority for offsetting the decline in stand vigour that often occurs in young stands that have nutrition problems as described by UBC SCHIRP research (Prescott and Weetman 1994). Application of urea and ammonium phosphate promotes rapid shading of salal by hemlock, improved nutrient cycling, and subsequent increases in stand productivity, thus accelerating green-up and shortening rotation length. Fertilization may be applied in stands that are scheduled to be harvested within ten years. Late rotation fertilization generally yields the highest return on investment of silvicultural treatments (McWilliams and Carter 1998). Treatments such as fertilization that shorten rotation age may provide an immediate benefit in available timber due to the Allowable Cut Effect.

Surveys of appraisal areas have a high priority because prescriptions, e.g. SMPs, and layout must be done to realize other high priority projects.

Riparian restoration (denoted as 'other' on Table B) is a high priority. Treatments such as girdling, variable density spacing, and cluster planting within RMZs can provide structural diversity within the landscape, promote wildlife habitat, and increase timber availability where harvesting has occurred immediately adjacent to streams.

Spacing is a high priority. It is done in stands of >5,000 stems/ha to increase the piece size at final harvest, reduce rotation length, increase stand value, provide habitat, and set up stands for commercial thinning. Spacing is an important component of formal partnerships with First Nations groups. It provides a means of training First Nations workers for entry into other forestry operations.

References

McWilliams, E.R.G. and R.E. Carter. 1998. Silviculture Investment Opportunities: A Methodology for Identifying Key Decision Variables. FRBC Contract No. HQ96463-RE.

Prescott, C.E. and G.G. Weetman. 1994. Salal, Cedar, Hemlock Integrated Research Program: a synthesis. UBC Faculty of Forestry. p. 68-71

TFL Forest Limited - Forest Renewal BC MYA CON 0001069 PAM98605

RESOURCE MANAGEMENT PLAN

SUSTAINABLE HARVEST STRATEGIC OBJECTIVE

TFL 47;

(Bonanza Lake Management Unit and portion of the Johnstone Straits Management Unit within the Port McNeill Forest District)

First Draft

This document and the attached tables recommend sustainable harvest activities in portions of TFL 47 located within the Ministry of Forests Port McNeill Forest District to support the Forest Renewal BC Sustainable Harvest Strategic Objective.

Areas within the TSA, within or adjacent to areas where TFL Forest Ltd. operates, are not included in this plan.

Prior to finalization, this plan must be reviewed and approved by TFL Forest Ltd. divisional foresters. This has not yet occurred. Most areas have not been identified on the ground. Some of the areas recommended for activities cannot be identified on the ground until pertinent inventories and strategic plans have been completed, i.e. visual landscape inventories, landscape level plans for biodiversity, stream inventories, or ungulate range plans.

REFERENCES AND ANALYSES

This plan is based on:

1. TFL Forest Limited, TFL 47 Management Plan No. 2, December 1996;
2. Timber Supply Analysis, September 1996, Appendix III to Management Plan No. 2;
3. Information Report No. 2 - TFL 47 Management Plan No. 2, Density Management: Assumptions in Timber Supply Analysis and Relationships to Future Product Opportunities;
4. Information Report No. 3 - TFL 47 Management Plan No. 2, Relationships between yield analysis assumptions, harvest strategies and stand management practices;
5. BC Ministry of Forests, TFL 47 Rationale for allowable annual cut determination, December 1996;
6. McWilliams, E.R.G. and R.E. Carter, 1998. Silviculture Investment Opportunities: A Methodology for Identifying Key Decision Variables. FRBC No. HQ96463-RE
7. Backlog and Enhanced Forestry Strategies within TFL 47. B.A. Blackwell and Associates Ltd. 1999.

8. Statement of Management Objectives, Options and Procedures. TFL No. 47. Management Plan No. 3. 1999

It is important to note that the portions of TFL 47 on Hanson Island, West Cracroft Island and East Cracroft Island, are included in the area administered by the Port McNeill Forest District but are compiled and analyzed in the above documents as part of the Johnstone Straits Management Unit. Timber supply analysis was not redone to conform to Forest District boundaries for this Resource Management Plan. Area on these islands is included in the recommended activities within the Port McNeill Forest District.

DESCRIPTION OF THE BONANZA LAKE MANAGEMENT UNIT

The following paragraph is paraphrased from BC Ministry of Forests, TFL 47 Rationale for allowable annual cut determination, December 1996.

The Bonanza Lake management unit is located on Vancouver Island in the area surrounding Bonanza Lake. It lies immediately south of Telegraph Cove and is bounded by the heights of land that surround the lake. The communities of Port McNeill, and to a lesser extent, Alert Bay, Sointula, Beaver Cove and Telegraph Cove are associated with this management unit. The unit is contained within a valley formed by glacial processes and is classified within the Coastal Western Hemlock biogeoclimatic zone. Productive forest land makes up 84 percent, or 31,903 ha, of the Bonanza Lake unit, while 62 percent, or 23 358 hectares, is considered available for timber harvesting. Harvesting operations started in this area in the 1940s. The current AAC for the management unit is 200,000 cubic meters (effective December 1, 1996)

Basic Data

Total forested area	37,166 ha	(new compilation for current SMOOP)
Net harvestable area	27,155 ha	(new compilation for current SMOOP)
AAC	200,000 m3	(January 1, 1997 to December 31, 2001)

Site Class Profile

Site index	Percent
10	8.2%
15	11.7%
20	22.2%
25	29.0%
30	20.6%
35	7.8%
40	0.3%
	100.0%

Species Profile

Leading species	Percent
Ba	4.4%
Cw	2.4%
Dr	0.6%
Fd	11.0%
Hw	66.1%
Pl	0.0%
Ss	0.6%
Yc	14.9%
	100.0%

Age Class Profile

Age Range	Percent
0-9	7.0%
10-19	15.4%
20-29	13.4%
30-39	8.1%
40-49	7.4%
50-59	3.2%
60-69	1.2%
70-79	1.2%
80-89	1.4%
90-99	0.7%
100-109	0.2%
110-119	0.3%
120-129	0.2%
130-139	0.1%
140-149	0.0%
250+	40.1%
	100.0%

Silviculture History

See attached table 7G in appendix V

Harvest Forecast

The following paragraph is paraphrased from BC Ministry of Forests, TFL 47 Rationale for allowable annual cut determination, December 1996.

A decline from short-term harvests to the long-term level is projected for Bonanza Lake unit. The base case projects a decrease of approximately 14 percent over the next two decades from the initial harvest level to the long-term level as the high volume old-growth timber that is available for harvest in this unit is utilized. Long term harvest levels are currently estimated to be about 155,000 cubic meters.

The planning process for TFL 47 Management Plan No. 3 is underway. The timber supply information package is due August 31, 1999. Inventory information, analyses and strategies to address these and other issues will become available during the planning process. Pertinent inventories and plans will be used to develop and refine this sustainable harvest plan. They will not be anticipated or duplicated. Pertinent plans and inventories under development are noted in the following.

ISSUES

Issues which may significantly affect **harvest levels** are:

1. Possible underestimates of site productivity, especially on areas forested by immature (< 20) and over mature (> 150) stands - potential increase to medium and long term timber supply.
2. Possible overestimate of constraints to harvesting for soil stability - potential increase, primarily to short term, but also to medium and long term timber supply.
3. Possible underestimate of constraints to harvesting for biodiversity (includes impacts from variable retention systems as well as old-growth reserves and retention of mature timber) - potential decrease to short, medium and long term timber supply.
4. Possible underestimate to constraints to harvesting for visual aesthetics - potential decrease to medium and long term timber supply.
5. Possible overestimate of mature stand volumes - potential decrease to short- and medium timber supply.
6. Possible underestimate of constraints to harvesting in Riparian Management Zones - potential decrease to short, medium and long term timber supply.

Value and market flexibility are most sensitive to:

1. Cost to harvest and regenerate the stand
2. Declining component of large diameter Cw and Yc.
3. Second growth timber volume / ha and value

RECOMMENDED PROGRAM

Cost, area and timing data for the following program is recorded on Tables A - F and Summary, attached.

Objective: Return on investment

As on all TFL Forest Ltd. forest lands, optional silvicultural investments on the Bonanza Lake management unit are directed first to generate a positive financial return.

Planned activities:

1. Aerial fertilization of Douglas-fir, mid to late rotation. Area available for 1 year program. Planned for 1999.
2. Brushing of impeded stands. Area limited. Substantial area of F-G surveys required to locate this. Survey and start work in 2000.
3. Reforestation of backlog and legal obligation areas. Focus on area lost to roads and trails. Area may not be treated under WRP. Area very limited. Will be identified in F-G surveys. Survey in 2000. Start work in 2001.

4. Road-side and aerial fertilization of F retained after partial cut harvest. Areas harvested with variable retention or commercially thinned - pertinent also to recreation areas and riparian management zones. Area extremely limited. Treatments will be incorporated into plan when (if) identified.
5. Additional treatments with positive financial return will be incorporated into plan when (if) identified.

Objective: Employment

Planned activities:
1. Spacing of dense Hw stands. Substantial area available. Work planned every year. When plans are developed, stands will be selected primarily to achieve other objectives identified in the following.

Objective: Increase stand windfirmness to allow future harvest pattern flexibility and maximize harvest opportunity.

Target areas are those to be harvested under variable retention systems; applicable especially to recreation areas and areas adjacent riparian reserves.

Identification of candidate areas for treatment requires area plans. Pertinent plans and inventories under development as part of TFL Management Plan No. 3, upon which area plans and stand tending prescriptions will be based, are:
- Visual Landscape Inventory - "Known Scenic Areas" have been identified by the District Manager - update of inventory underway.
- Recreation analysis report - being discussed with Port McNeill Forest District.
- Variable Retention Strategies - being developed by TimberWest.
- Ungulate Winter Ranges have been identified. They will be assessed and stand management plans developed for them as part of the sustainable harvest strategic objective.

Planned activities:
1. Spacing to increase windfirmness in areas planned for commercial thinning, dispersed retention and small openings. Plan in 2000. Start work in 2001. Area limited, but should increase.

Objective: Product (market) diversity

Planned activities:
1. Increasing proportion of large-diameter Cw and Yc at next harvest in dense stands of Hw through spacing / cleaning / reducing multiple-stemmed Yc to single stems. Treatment of only target species rather than treatment of the entire stand will be evaluated for financial feasibility. Substantial area available - can be combined with spacing for density control. Will be incorporated into spacing program.

Objective: Management of ungulate winter and spring ranges

Identification of candidate areas for treatment requires area plans. Ungulate Winter Ranges are being confirmed in preparation for the Timber Supply Analysis for Management Plan No. 3.

Planned activities:

1. Ungulate winter ranges will be assessed and stand management plans developed for them as part of the sustainable harvest strategic objective. Area limited. Plan in 2000.

2. Spacing and perhaps pruning and fertilization to encourage development of desired habitat conditions. Applicable only where this will allow an increase in financially attractive harvesting opportunities. Area limited. Start work in 2001.

Objective: Management for Biodiversity.

To ensure the availability of areas supplying mature forest characteristics, perhaps connecting old growth reserves, while maximizing harvest opportunities. Identification of candidate areas for treatment requires area plans. A Biodiversity plan is scheduled to be completed by TFL Forest Ltd. approximately 8 months following completion of Landscape Unit Planning. This may be a few years off.

Planned activities:

1. Spacing and perhaps pruning and fertilization to encourage development of desired habitat conditions. Applicable only where this will allow an increase in financially attractive harvesting opportunities. Area limited. Plan in 2000? Start work in 2001.

Objective: Comfor program.

This program garners community support for the forest industry as well as supporting / motivating future forest workers prior to commencement of advanced training. If this program is denied eligibility, funds will be redirected into the spacing program.

Planned activities:

1. A mix of activities - all selected to have investment or other merit. Planned for 2000 and all subsequent years.

DESCRIPTION OF THE JOHNSTONE STRAITS MANAGEMENT UNIT

The following paragraph is paraphrased from BC Ministry of Forests, TFL 47 Rationale for allowable annual cut determination, December 1996.

The Johnstone Straits management unit is located on the islands and peninsulas that protrude into Johnstone Straits, which separates northern Vancouver Island and the British Columbia mainland. The unit extends along the strait to include the islands and portions of the mainland coast from the northwestern parts of Quadra Island in the south, to include Hanson Island in the north. This unit surrounds or is in the vicinity of Campbell River and Sayward. A significant component of harvesting operations in this management unit is camp-based. The management unit is characterized by coastline with mountainous, but not especially rugged or steep terrain. The majority lies within the Coastal Western Hemlock biogeoclimatic zone with small portions in the Mountain Hemlock zone. Ninety-two percent, or 93,971 hectares, of the Johnstone Strait unit is considered productive forest and 81 percent, or 82,002 hectares, is considered part of the timber harvesting land base. Timber harvesting in this management unit began in the early 1900s along the coastline and moved inland as technological innovations allowed. The current AAC for the management unit is 425,000 cubic meters (effective December 1, 1996)

Basic Data

Total forested area	87,042 ha	(new compilation for current SMOOP)
Net harvestable area	70,463 ha	(new compilation for current SMOOP)
AAC	425,000 m^3	(January 1, 1997 to December 31, 2001)

Site Class Profile

Site class	Percent
10	4.2%
15	13.1%
20	10.4%
25	20.8%
30	25.6%
35	15.4%
40	2.5%
	100.0%

Species Profile

Lead species	Percent
Ba	0.6%
Cw	4.8%
Dr	5.3%
Fd	26.3%
Hw	59.3%
Mb	0.0%
Pl	2.0%
Ss	0.0%
Yc	1.7%
	100.0%

Age Class Profile

Age Range	Percent
0-9	5.5%
10-19	11.1%
20-29	5.9%
30-39	8.6%
40-49	4.6%
50-59	5.2%
60-69	23.2%
70-79	13.6%
80-89	4.1%
90-99	3.4%
100-109	0.9%
110-119	0.7%
120-129	0.5%
130-139	0.3%
140-149	0.2%
250+	12.2%

Silviculture History

See attached table 7H, appendix V.

Harvest Forecast

The following paragraph is paraphrased from BC Ministry of Forests, TFL 47 Rationale for allowable annual cut determination, December 1996.

The 1996 harvest forecast projects a timber supply increase over the next two decades from the current harvest of 425,000 cubic meters to long-term levels between 570,000 and 588,000 cubic meters. Most of this harvest will be from second growth stands.

The planning process for TFL 47 Management Plan No. 3 is underway. The timber supply information package is due August 31, 1999. Inventory information, analyses and strategies to address issues will become available during the planning process. Pertinent inventories and plans will be used to develop and refine this sustainable harvest plan. They will not be anticipated or duplicated. Pertinent plans and inventories under development are noted in the following.

ISSUES

Issues which may significantly affect **harvest levels** are:

1. Probable underestimate of site productivity on areas forested by mature stands - increase to short, medium and long term timber supply.
2. Underestimate of productivity increase from planting genetically improved stock - increase to medium and long term timber supply.
3. Possible underestimate of additional volume available from commercial thinning and fertilization (especially mature timber held past rotation age for biodiversity, visual, or other objectives) - increase to short and medium term timber supply.
4. Possible underestimate of constraints to harvesting for biodiversity (includes impacts from variable retention systems as well as old-growth reserves and retention of mature timber) - potential decrease to short, medium and long term timber supply.
5. Possible underestimate of constraints to harvesting for riparian protection - potential decrease to short, medium and long term timber supply.
6. Possible underestimate of constraints to harvesting for visual aesthetics and recreation (includes marine buffers and areas near population centers, especially those in VILUP Forestry Sensitive Zones) - potential decrease to short, medium and long term timber supply.

Value and market flexibility are most sensitive to:

1. Second growth timber volume / ha and value
2. Cost to harvest and regenerate the stand

RECOMMENDED PROGRAM

Objective: Return on investment

As on all TFL Forest Ltd. forest lands, optional silvicultural investments on the Johnstone Straits management unit are directed first to generate a positive financial return.

Planned activities:

1. Aerial fertilization of Douglas-fir, mid to late rotation. Large area available. Treatment planned for 1999 and 2000.
2. Brushing of impeded stands. Area limited. Substantial area of F-G surveys required to locate this. Survey and start work in 2000.
3. Reforestation of backlog and legal obligation areas. Focus on area lost to roads and trails. Area may not be treated under WRP. Area very limited. Will be identified in F-G surveys. Survey in 2000. Start work in 2001.
4. Road-side and aerial fertilization of F retained after partial cut harvest. Areas harvested with variable retention or commercially thinned - pertinent also to recreation areas and riparian management zones. Area currently limited but expected to increase. Annual program planned.
5. Additional treatments with positive financial return will be incorporated into plan when (if) identified.

Objective: Employment

Planned activities.

1. Spacing of dense stands, primarily to ensure F dominance. Modest area available but free-growing stands coming on-line. Work planned every year. When plans are developed, stands to be spaced will be selected to achieve other objectives identified in the following as greatly as possible.

Objective: Increase stand windfirmness to allow future harvest pattern flexibility and maximize harvest opportunity.

Target areas are those to be harvested under variable retention systems or commercially thinned; applicable particularly to recreation areas, areas adjacent population centers, areas with increased water quality emphasis such as riparian management zones and community watersheds, and areas constrained for visual objectives.

Identification of candidate areas for treatment requires area plans. Pertinent plans and inventories under development as part of TFL Management Plan No. 3, upon which area plans and stand tending prescriptions will be based, are:

- Visual Landscape Inventory - update of inventory underway.
- Recreation analysis - to be completed by TimberWest in time for TSA information package.
- Variable Retention Strategies - being developed by TimberWest.

Planned activities.

1. Spacing to increase windfirmness in areas planned for commercial thinning, dispersed retention and small openings. Plan in 2000. Start work in 2001. Area limited, but should increase.

Objective: Management for Biodiversity.

To ensure the availability of areas supplying mature forest characteristics, perhaps connecting old growth reserves, while maximizing harvest opportunities. Identification of candidate areas for treatment requires area plans. A Biodiversity plan is scheduled to be completed by TFL Forest Ltd. approximately 8 months following completion of Landscape Unit Planning. This may be a few years off.

Planned activities.

1. Spacing and perhaps pruning and fertilization to encourage development of desired habitat conditions. Applicable only where this will allow an increase in financially attractive harvesting opportunities. Area limited. Plan in 2000? Start work in 2001.

Studies.

Three studies are proposed in the Port McNeill Forest District:

1. Backlog Reforestation. To document effects of site prep (none and mounding) and fertilization (none and 10g N at time of planting + 30g N at time of brushing in second year) plus establishment and tending costs and growth rates (to forecast yields). $4,000 to establish, $3000 to assess.
2. Stand Tending. To document effect of early individual tree cleaning and fertilization to enhance presence of Cw and Yc in second growth harvests. $8,000 to establish (repeat in second year), $4,000 to assess (2 years after establishment).
3. Habitat Supply. To establish assessment plots in areas treated to provide future ungulate winter range (repeat over three years). $8,000 to establish. Assessment beyond 2005.

Working Targets

1. Increase yields in short, medium and long term in direct proportion to area fertilized, rehabilitated, and brushed. All projects to yield a positive return on investment.

2. Increase proportion of dominant Cw and Yc in merchantable second growth stands to 10% of volume in medium and long term.

3. Develop stand structures that allow greater harvest flexibility in the medium and long term to support landscape, biodiversity, identified wildlife, recreation, and water quality objectives.

Quatsino Tree Farm Licence 6
Sustainable Harvest Component of Port McNeill District Resource Management Plan

Introduction

This document is submitted in response to the Ministry of Forests and Ministry of Environment request for a Resource Management Plan to outline Forest Renewal BC funded silviculture programs. This information is drawn from Management Plan 8 for Tree Farm Licence 6, Management Plan 9 for Tree Farm Licence 25 and the Silviculture Plan submitted to the Ministry of Forests in September 1999.

Basic Data

Administrative Information

Western Forest Product's Quatsino Tree Farm Licence 6 (TFL 6) is made up of two management areas located on northern Vancouver Island. Block 1 is the largest management unit and includes watersheds that drain either into Quatsino Sound or the Pacific Ocean between Quatsino Sound and San Josef Bay. Block 1 is the original TFL 6 area granted to Western's predecessor, British Columbia Pulp & Paper Company Limited as Quatsino Forest Management Licence 6 on October 26, 1950.

Block 2 includes watersheds that drain into Queen Charlotte Strait between Fort Rupert and Port McNeill. Block 2 is the former Block 4 of Tree Farm Licence 25 which was granted to another predecessor company, Alaska Pine and Cellulose Limited, on May 21, 1958. On October 1, 1998 these two areas were consolidated into a new TFL 6 made up of Block 1 (former TFL 6) and Block 2 (former TFL 25 Block 4).

Land Area

The Licence covers approximately 201,500 hectares. The majority (170,200 ha) lies in Block 1 and the minority (31,300 ha) in Block 2.

Annual Allowable Cut and Harvest Forecast

The current AAC for Tree Farm Licence 6 is approximately 1,476,758 m^3/year. Over the next five decades the current Timber Supply Analysis indicates this harvest rate will decline to a Long Run Sustained Yield (LRSY) of between 1,137,000 m^3 and 1,187,000 m^3 year depending on future management assumptions.

Site Class Profile

The twenty ecosystem associations found within the TFL are grouped into seven productivity classes for timber supply modelling purposes. The site index for each productivity class is a weighted average of the individual species site indices for each ecosystem association. Table 20 lists the ecosites and productivity information.

Table 20 - TFL 6 Ecosite Summary

Ecosite	WFP Ecosystem Association	Site Indices Range (m)	Site Indices Average (m)	LRSY MAI (m^3/yr)	Operable Area (ha)
EE	S3	30-36	33.9	12.2	17,700
EG+	S4, S5, S13	27-33	30.6	10.0	11,700
EG	S1HA, S12	25-30	27.8	8.8	86,700
EG-	M1, M^3, M5	21-25	23.6	6.8	19,000
EM	S1CH	16-20	17.9	4.5	14,500
EL	S2, S6, M^3, M4	14-18	16.4	3.8	6,300
EVL	S7, MH, CP	11-15	12.0	1.9	1,000
Total				8.5	156,900

Age Class Profile

Just over 93 percent of the TFL 6 area is forested. Table 21 provides the age breakdown of the forested area by seral class. This information was drawn from the GIS database and is current to January 1, 1996.

Table 21 – TFL 6 Seral Stage Distribution

Seral Age Class	Approximate ha	Forested Area
0-40 Years	68,900	36%
41-80 Years	28,200	15%
81-250 Years	14,700	8%
250+ Years	78,500	41%
Total	190,300	100%

Species Profile

The TFL leading groups are: Hw/Ba 73%, Cw/Cy 22%, Ss 4% and Other 1%.

Timber Supply Issues

Timber Quantity

As noted in section 1.3 the current AAC for Tree Farm Licence 6 is approximately 1,476,758 m3/year. Over the next five decades this harvest rate is projected to fall to a Long Run Sustained Yield of between 1,137,000 m3 and 1,187,000 m3 depending on management assumptions.

Forest policy and factors affecting harvest rates have changed since the Timber Supply Analysis supporting the TFL 6 annual allowable cut was completed. There has been implementation of the Forest Practices Code with green-up and block size requirements, the release of the Identified Wildlife Management Strategy as well as the initial stages of Landscape Unit Planning.

WFP staff have started work on the TFL 6 Management Plan 9 Timber Supply Analysis. This analysis will incorporate these constraints as well as model development spatially. This will be the first time spatial constraints will be used on such a large planning area. It is possible that the new factors being considered will force the harvest rate to LRSY earlier than predicted or push LRSY below earlier projections.

Timber Quality

The last TSA projected that the bulk of the TFL 6 harvest will continue to come from old growth forest for the next thirty to forty years. In the fifth decade, harvest will be dominated by second growth. If projected rotations do not allow time for the development of quality characteristics such as small knots, clear wood and mature fibre there could be a reduction in stand value not only on a cubic meter basis but also on a hectare basis.

WFP's growth and yield models indicate that rotations can be extended without a significant impact on LRSY MAI. For TFL 6, WFP has adopted an average rotation of 104 years. This rotation will produce stands with an average diameter in the 40 to 45 cm dbh range. The average rotation that would maximize yield (82 years) will only produce stands with an average diameter in the range of 30 to 35 cm dbh. The impact on LRSY from longer rotations is to reduce the average MAI from 8.8 to 8.5 m^3 yr or 3 percent. The minor loss in quantity is more than offset by an increase in future value.

A timber quality analysis produced with the TFL 6 Management Plan compared second growth grades predicted by the model to produced grades from current second growth logging. The analysis indicated that using basic silviculture regimes (planting and brushing) at planned rotations (104 years on average) will produce a second growth grade profile similar to our experienced production from second growth stands.

The analysis also compared projected second growth values and volumes to current old growth values and volumes on a per hectare basis. Surprisingly, the value of second growth stands on a per hectare basis will be similar to old growth. Although the average value of old growth on a per cubic meter basis is higher, it is offset by the higher merchantable volume per hectare found in second growth stands. As a result, the net value per hectare is roughly equivalent.

The analysis concluded that when longer rotations are compared to silviculture treatments to increase diameter and value, there is little economic justification for silviculture intervention. However, it did note that pruning would be necessary it there was a desire to produce the highest grades.

Forest Health

There have been minor forest health and protection issues over the history of TFL 6. The most visible insect pests have been the black-headed budworm and spruce shoot weevil. The budworm has appeared on a ten to twenty year cycle and caused significant defoliation but there has been little mortality or volume loss. The sitka spruce shoot weevil has restricted the areas where sitka spruce can be regenerated. The weevil is being addressed through WFP's Saanich Forestry Centre tree improvement program.

Hemlock dwarf mistletoe and root rots are common but not debilitating to developing stands. Mistletoe is addressed through regular and residual falling. There are no plans for FRBC funded control programs. Health issues are monitored through regular silviculture surveys. Pest outbreaks are monitored with special surveys.

Habitat Supply

The two historic habitat supply issues in TFL 6 has been for ungulate winter ranges and raptor nests. In the late 1970's and early 1980's fourteen deer winter range areas totaling 2040 ha were established in TFL 6. In 1998 the majority of these sites were grandfathered as Ungulate Winter Ranges. In 1998 and 1999 the winter ranges noted as well as other potential wildlife habitat areas were inventoried for attributes critical to a short list of species. A final report will be available in mid-1999. Two young second growth Deer Winter Habitat Zones have been identified for management at Holberg. These areas, totaling approximately forty hectares, will be evaluated in 2000/2001 for modification in subsequent years of the plan.

An inventory of eagle nests has been maintained for TFL 6 since 1989. Other large raptor nests which are not observable from the air are added to this inventory as they are detected. The reservation of marine sensitive zones and riparian management areas appears to have addressed many of the habitat issues for these species.

To date the WFP silviculture program has not focused on habitat supply issues. A riparian area recovery project is being proposed through the WRP program but there is no intention at this time to expand this beyond the pilot stage.

Historic Backlog and Intensive Silviculture Program

History

The 1998 TFL 6 Annual Report Appendix XIII has been attached to provide a summary of historical silviculture work. To the end of 1998 24,084 ha were brushed, 10,515 ha were precommercially thinned, 2,581 ha were pruned, 6,612 ha of post-establishment fertilization was *done, 20 ha converted to conifer production and 10 ha drained. A small backlog area is planted each year but the program is so small that it is not tracked separately from the regular program.*

Effect on Previous Timber Supply Analyses

Backlog Planting and Brushing

Backlog planting has almost been eliminated as a program. Small areas found in free-growing surveys are addressed as needed. Brushing has been conducted as a routine treatment to maintain conifer dominance on sites. As timber supply models assume normal conifer stocking these programs have had no effect on Timber Supply.

Pre-Commercial Thinning

The TFL 6 MP 8 Timber Supply Analysis assumptions incorporated a juvenile spacing rate that varies from the historic TFL 6 level (10-15% of annual harvest area) to twice the historic level. The impact on Timber Supply from pre-commercial thinning was slightly negative. These results were not surprising as the data used in the TSA for TFL 6 did not show an age class imbalance that would have benefited from PCT.

Pruning

The TFL 6 MP 8 Timber Supply Analysis did not model pruning as pruning only increases wood quality and not quantity.

Fertilization of Cedar-Salal Sites

The TFL 6 MP 8 Timber Supply Analysis modeled the impact of the cedar/salal fertilization program that had been completed to the end of 1990. As for PCT, there was no effect on LRSY. However, to the end of 1990 only 1,300 out of 49,500 second growth hectares had been fertilized so the lack of impact on LRSY was not unexpected.

The next TFL 6 timber supply analysis will incorporate over 10,000 hectares of fertilized area. From SCHIRP research trials we expect that there will be a permanent increase in site indices from a range of 17 to 21 to 21 to 25 as a result of this treatment. This will translate into an MAI increase of between 1.9 and 2.2 m3/year or 20,000 m3.

Site Conversion

A single site conversion trial has returned a second growth mixedwood site to conifer production. The formerly non-contributing site is now growing 12 m3/ha/year. The trial has no impact on timber supply projections.

Drainage

Seedling growth and water flow is being monitored on a 10 hectare drainage trial near Port McNeill. It is hoped to increase site productivity from 3 to 6 m^3/ha/yr. The trial has no impact on timber supply.

Future Timber Supply

The current TFL 6 Management Plan Timber Supply Analysis predates the Forest Practices Code and the Vancouver Island Land Use Plan. This analysis was, when compared to today's requirements, relatively unconstrained and did not include a spatial component.

The TFL 6 Management Plan 9 Timber Supply Analysis will be Code compliant and will include provincial initiatives such as the Identified Wildlife Management Strategy and Landscape Unit Planning. The MP will also have a spatial component so that issues such as green-up and patch size will have a constraining effect on harvest levels. We anticipate that there will be downward pressure on the current annual allowable cut.

Timber Supply Quantity Improvement

The volume forecasts which WFP growth and yield models utilize are reduced by approximately 20% to recognize operational factors that reduce stocking and final volume on an area basis. It would be possible to reduce this Operational Adjustment Factor (OAF) through a very aggressive stocking and brushing program. The issue of an "enhanced" basic program has been raised in the past but never approved for implementation by the Ministry of Forests or FRBC. A number of "enhanced" basic treatments are presented in Table 20 but have not been included on the RMP tables.

"Impeded" treatments are necessary to maintain minimum stocking on pre-1987 areas. These treatments maintain modeled stocking and volumes so they do not increase timber supply.

Precommercial thinning will have little impact on LRSY unless the new TFL 6 Timber Supply Analysis indicates that the new management constraints will cause an age class imbalance or spatial development problem. The benefit to be gained from PCT will depend on the degree of imbalance. PCT could be conducted on EG- and better ecosites.

SCHIRP research indicates that fertilization of young hemlock/cedar stands to attain crown closure can have a positive effect on site productivity and harvest rates, especially if the treatments result in permanent growth effects. If the SCHIRP results

can be attained operationally and all suitable ecosystems are treated, the TFL 6 AAC could be increased by up to 40,000 m3. Cedar/salal fertilization would focus on EM ecosites.

North Island alder stands are presently non-contributing. Conversion of these stands to conifer production would provide a small AAC increase depending on the magnitude of the area treated. While many areas are environmentally constrained, it is estimated that up to 1/3 of the existing alder stands could be converted. As recovery of material complicates FRBC funding, policy would have to be developed in advance of treatment.

TFL 6 contains over 7,000 ha of EL and EVL ecosite. Much of this area will be retained for wildlife and other values. However, if only 1,000 hectares were drained, there could be an AAC increase of up to 3,000 m3/yr. Additional trial sites could help develop drainage expertise and supply additional data to confirm seedling response.

Potential quantity improvements are summarized in Table 22.

Timber Supply Quality Improvements

The current TFL 6 Timber Supply Analysis compared predicted second growth to actual produced second growth grades as well as predicted second growth grades relative to produced old growth grades. This analysis indicated that while stand values on a per hectare basis were higher in second growth due to higher merchantable volumes, it would not be possible to produce higher grades without pruning. The potential improvement from pruning was not modeled. Figure 8 from the TFL 6 Management Plan is attached to show the projected and actual grades and values from this analysis. Pruning could be conducted on EG- and better ecosites.

The TSA also showed that PCT could produce a modest increase in average stand diameter. For average sites, stand diameter could be increased by approximately 10%. This would translate into a modest increase in grade.

Potential quality improvement area summarized in Table 22.

Proposed Program

The proposed sustainable harvest program has been attached as Table A Table B and Table F within appendix VI. This program covers currently eligible impeded backlog and enhanced silviculture projects. It also includes a new habitat supply project that was not included in the previous 2000/2001 program submitted to the Ministry of Forests or FRBC. The balance of the program for 2000/2001 follows the revised program submitted in March 1999 while the following years match the program submitted in September 1998.

Other Considerations

The provincial enhanced silviculture program has historically had a social component. The employment and social values were given even greater importance under the initial Forest Renewal BC mandate. To date licensee and government programs have ensured that a proportion of the silviculture program was directed to local communities and First Nations.

Western Forest Products has encouraged the development of local First Nations silviculture contractors through the award of silviculture contracts at market prices. We have also supported summer student employment through the Regional District's Community Forestry Program. It is our expectation that RMPs retain sufficient flexibility to incorporate these programs and partnerships into new programs.

Table 22. Opportunities to Improve Timber Quantity and Quality

Activity/ Eligibility	Current Requirements	Treatment Regime	Potential Program *	Term of Benefit	Employment **
Site Preparation NO	Provincial Standards	• Burning and mechanical treatments to get uniform stocking and growth (fewer voids). Reduce Operational Adjustment Factor by 5% and increase MAI by 6%.	• 300 ha/year, 50% higher cost = $150,000/year	Long Term	Current – 375 MDs Future – 90 MY
Regeneration Delay NO	Provincial Standards	• Reduce regen delay by 3 years. Will provide an MAI increase of 2%. • Reduce green-up by 3 years.	• 100% planting, +200K at current rate = $200,000/year.	Long Term	Current – 300 MDs Future – 30 MY
Stocking NO	Provincial Standards	• Higher stocking (1500 – 2000/ha) to reduce voids. Target 5% reduction in OAF. • Larger planting stock to increase basal area at 15 years by 25% yielding final crop increase of 5%. • Use "A" seed for all (H, C, S, F) planting. Use 5% average.	• Additional 800,000 trees/year (Current stocking + 50%) at current rate = $800,000. • Size upgrade on 2.4 million trees @ $.15/tree = $360,000. • 2 million trees @ $.02/tree = $40,000	Long Term	• Current – 1200 MDs • Future – In 6%OAF • Current -550 MD • Future – 75 MY • Current – 0 MD • Future 75 MY
Fertilization at Planting & Pre-FtG NO	Not Required	• Fertilizer tabs at planting. Hand or aerial follow-up around age 5. • Shorten green-up, achieve earlier canopy closure on cedar/salal sites	• 960,000 trees/year @ $.12/tree - $144,000	Long Term	Current – 220 MD Future – Unknown
Brushing YES./NO (Impeded only)	Provincial Standards	• Basic program to meet targets. • Aggressive brushing to maintain high stocking levels noted above.	• Maintenance Program. • Double appraisal program to 300 ha/year @ $1,000/ha = $300,000	Long Term	Current Current – 750 MD Future – Covered above.
Pre-Commercial Thinning YES	Not Required	• Stocking control to 800 to 1200 SPH at age 10-15 will shorten rotation at the expense of final volume (-2% LRSY). Applicable in units with age class problems. Target First Nation employment goals.	• Possible to maintain a 350 ha/yr steady state program. At NFO rates = $875,000.	Short Term	Current - 2200 MD Future - <30 MY>
Pruning YES	Not Required	• First lift of 2.5 to 3.5 m of stem followed by second lift to 5.5 m of stem. First lift once dbh at 10 cm. • Minimum clear sheath of 15+cm needed to increase grades. Target First Nation employment goals. • Pruning of second growth cypress to discourage basal branch development.	• A large backlog of previously spaced stands remains. Once liquidated a 350 ha/yr steady state program can be maintained. At NFO rates = $1,050,000. • Program to match planting. 10 ha/yr @ $500.	Long Term	Current – 2600 MD Future – NA
Fertilization YES	Not Required	• Two treatments of cedar/salal sites to achieve canopy closure. First fertilization at free-growing and second eight to ten years after. MAI increase of 2 m3/year.	• 1500 ha/yr @ $600/ha = $900,000.	Long Term	Current – 300 MD Future – 40 MY
Drainage YES	Not Required	• Drain S6/S7 ecosystems to improve productivity up to 50%.	• Trial program of 20 ha/yr = $40,000.	Long Term	Current – 40 MD Future – Trial Only
Stand Conversion NO	Not Required	• Convert non-AAC contributing deciduous stands to conifer production.	• Ten year program of 60 ha/year @ $6,000/ha = $360,000/year.	Long Term	Current – 600 MD Future – 6 MY

* Base Case is current AAC rounded to 1,500,000 m3/yr for convenience.

** Current employment generation is based on $400/MD for labour, $250/MD for materials, $1000/MD for machines and $3000/MD for fertilization.
Future employment based on 1,000 m3/MY of AAC

Appendix I

Kingcome TSA & TFL Summary

Table 1. Port McNeill Forest District (TSA & TFL)
Summary Table
August 31, 1999

Table Totals	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Priority
Table A: Backlog Activities	7,107	6,196	5,506	5,371	4,346	1,382,662	195	**3.2**, 7 9, N, 7 7, 6 3, 0 2
Table B: Stand Tending Activities	5,660	7,051	7,016	7,066	7,075	2,962,750	523	**4.2**, 5 3, N, 3 8, 3 8, 1 8
Table C: Forest Health Enhancement Activities	10	10	10	10	10	30,000	3,000	**5.6**, 9 0, N, 9 0, 9 0, N
Table D: Forest Health Maintenance Activities	9	9	9	9	9	9,000	1,000	**5.5**, 9 0, N, 9 0, 8 0, N
Table E: Current Fire and Pest Activities	4	4	4	4	4	3,300	825	**7.0**, 9 0, N, 9 0, 6 7, N
Table F: Habitat Supply Activities	640	506	466	266	265	447,000	698	**7.0**, 6 3, N, 9 0, 5 8, 0 5
Totals of all tables	13,430	13,776	13,011	12,726	11,709	4,834,712	360	

Activities Sorted by Priority (Ctl-e)

Management Unit	Table and category		Activity	Five-Year Plan Goals (ha) 2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Annual Plan 2000/01 Funding ($000)	Unit Cost ($)	Man. Unit Priority	Regional Priority
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	1 Planning/surveys/presc	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	3 Planting	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	4 Brushing	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	5 Seed Purchase	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	6 Max. density spacing	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Legal	7 Pruning	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	1 Planning/surveys/presc	#REF!	#REF!	#REF!	#REF!	#REF!	91,500	#REF!	2.2	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	2 Site preparation	#REF!	#REF!	#REF!	#REF!	#REF!	100,000	#REF!	3.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	3 Site Restoration Road/land	#REF!	#REF!	#REF!	#REF!	#REF!	0	#REF!	4.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	4 Planting	#REF!	#REF!	#REF!	#REF!	#REF!	205,000	#REF!	2.3	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	5 Brushing	#REF!	#REF!	#REF!	#REF!	#REF!	90,000	#REF!	2.3	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Backlog	6 Seed Purchase	5	5	0	0	0	350	70	3.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Impeded	1 Planning/surveys/presc	2,812	2,100	1,950	1,950	950	118,512	42	2.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Impeded	2 Site preparation	0	0	0	0	0	0	#DIV/0!	4.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Impeded	3 Planting	21	10	0	0	0	20,900	995	3.5	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Impeded	4 Brushing	1,064	1,010	760	760	760	752,400	707	2.5	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Impeded	5 Seed Purchase	0	0	0	0	0	0	#DIV/0!	4.7	0
Port McNeill Forest District (TSA & TFL)	A	Backlog Total	7 Studies	0	1	1	1	1	4,000	800,000	3.7	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	1 Planning/surveys/presc	1,830	3,490	3,490	3,465	3,480	146,450	80	1.3	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	2 Spacing	349	585	575	550	570	724,950	2,077	2.3	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	3 Pruning	216	450	450	450	450	490,800	2,272	5.8	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	4 Fertilizing	3,189	2,450	2,425	2,525	2,500	1,422,550	446	1.3	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	5 Studies	1	1	1	1	0	8,000	8,000	4.5	0
Port McNeill Forest District (TSA & TFL)	B	Stand Tending	6 Other	75	75	75	75	75	170,000	2,267	3.7	0
Port McNeill Forest District (TSA & TFL)	C	F. H. Enhancement	1 Site rehab	0	0	0	0	0	0	#DIV/0!	5.5	0
Port McNeill Forest District (TSA & TFL)	C	F. H. Enhancement	2 Spacing	0	0	0	0	0	0	#DIV/0!	5.5	0
Port McNeill Forest District (TSA & TFL)	C	F. H. Enhancement	3 Pruning	0	0	0	0	0	0	#DIV/0!	5.5	0
Port McNeill Forest District (TSA & TFL)	C	F. H. Enhancement	4 Studies	10	10	10	10	10	30,000	3,000	5.0	0
Port McNeill Forest District (TSA & TFL)	C	F. H. Enhancement	5 Others	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	#DIV/0!	4.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	2 Aerial Surveys (hours flying	9	9	9	9	9	9,000	1,000	3.3	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	3 Fall & burn treatment (trees	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	D	F. H. Maintenance	8 Other	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	1 Planning/surveys/presc	2	2	2	2	2	300	150	4.3	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	3 Planting	2	2	2	2	2	3,000	1,500	4.3	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	E	Current Fire/Pest	7 Other	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	1 Planning/surveys/presc	440	320	320	120	120	47,000	107	3.2	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	3 Planting	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	4 Brushing	0	0	0	0	0	0	#DIV/0!	5.7	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	5 Spacing	100	120	80	80	80	200,000	2,000	4.0	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	6 Pruning	100	65	65	65	65	200,000	2,000	3.5	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	7 Studies	0	1	1	1	0	0	#DIV/0!	4.7	0
Port McNeill Forest District (TSA & TFL)	F	Habitat Supply	8 Others	0	0	0	0	0	0	#DIV/0!	5.7	0
										Check totals		
Totals				#REF!	#REF!	#REF!	#REF!	#REF!	4,834,712	#DIV/0!	243	

Table 2. Port McNeill Forest District (TSA only)
Summary Table
August 31, 1999

Table Totals

	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Priority
Table A: Backlog Activities	3,000	2,850	2,500	2,500	2,500	772,500	258	3.2
Table B: Stand Tending Activities	1,400	1,400	1,400	1,400	1,400	725,000	518	4.2
Table C: Forest Health Enhancement Activities	10	10	10	10	10	30,000	3,000	5.6
Table D: Forest Health Maintenance Activities	8	8	8	8	8	8,000	1,000	5.5
Table E: Current Fire and Pest Activities	0	0	0	0	0	0	#DIV/0!	7.0
Table F: Habitat Supply Activities	0	0	0	0	0	0	#DIV/0!	7.0
Totals of all tables	4,418	4,268	3,918	3,918	3,918	1,535,500	348	

Activities Sorted by Priority (Ctl-e)

Management Unit	Table and category		Activity	Five-Year Plan Goals (ha)					Annual Plan 2000/01			
				2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority	Regional Priority
Timber Supply Area within Port McNeill	A	Backlog	Legal 1 Planning/surveys/presc	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 2 Site preparation	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 3 Planting	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 4 Brushing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 5 Seed Purchase	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 6 Max. density spacing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Legal 7 Pruning	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 1 Planning/surveys/presc	1,700	1,650	1,500	1,500	1,500	47,500	28	1	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 2 Site preparation	100	50	0	0	0	100,000	1,000	1	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 3 Site Restoration Road/land	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 4 Planting	200	150	0	0	0	200,000	1,000	1	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 5 Brushing	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Backlog 6 Seed Purchase	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Impeded 1 Planning/surveys/presc	500	500	500	500	500	25,000	50	1	0
Timber Supply Area within Port McNeill	A	Backlog	Impeded 2 Site preparation	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Impeded 3 Planting	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Impeded 4 Brushing	500	500	500	500	500	400,000	800	1	0
Timber Supply Area within Port McNeill	A	Backlog	Impeded 5 Seed Purchase	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	A	Backlog	Total 7 Studies	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	B	Stand Tending	1 Planning/surveys/presc	700	700	700	700	700	55,000	79	2	0
Timber Supply Area within Port McNeill	B	Stand Tending	2 Spacing	100	100	100	100	100	175,000	1,750	4	0
Timber Supply Area within Port McNeill	B	Stand Tending	3 Pruning	100	100	100	100	100	195,000	1,950	5	0
Timber Supply Area within Port McNeill	B	Stand Tending	4 Fertilizing	500	500	500	500	500	300,000	600	2	0
Timber Supply Area within Port McNeill	B	Stand Tending	5 Studies	0	0	0	0	0	0	0	6	0
Timber Supply Area within Port McNeill	B	Stand Tending	6 Other	0	0	0	0	0	0	0	6	0
Timber Supply Area within Port McNeill	C	F. H. Enhancement	1 Site rehab	0	0	0	0	0	0	0	6	0
Timber Supply Area within Port McNeill	C	F. H. Enhancement	2 Spacing	0	0	0	0	0	0	0	6	0
Timber Supply Area within Port McNeill	C	F. H. Enhancement	3 Pruning	0	0	0	0	0	0	0	6	0
Timber Supply Area within Port McNeill	C	F. H. Enhancement	4 Studies	10	10	10	10	10	30,000	3,000	3	0
Timber Supply Area within Port McNeill	C	F. H. Enhancement	5 Others	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	0	1	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	2 Aerial Surveys (hours flying	8	8	8	8	8	8,000	1,000	1	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	3 Fall & burn treatment (trees	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	D	F. H. Maintenance	8 Other	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	1 Planning/surveys/presc	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	3 Planting	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	E	Current Fire/Pest	7 Other	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	1 Planning/surveys/presc	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	3 Planting	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	4 Brushing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	5 Spacing	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	6 Pruning	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	7 Studies	0	0	0	0	0	0	0	7	0
Timber Supply Area within Port McNeill	F	Habitat Supply	8 Others	0	0	0	0	0	0	0	7	0
										Check totals		
Totals				4,418	4,268	3,918	3,918	3,918	1,535,500	11,257	263	

Table 3. Port McNeill Forest District (TFL only)
Summary Table
August 31, 1999

Table Totals	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
Table A: Backlog Activities	4,107	3,346	3,006	2,871	1,846	610,162	149	5.5
Table B: Stand Tending Activities	4,260	5,651	5,616	5,666	5,675	2,237,750	525	3.7
Table C: Forest Health Enhancement Activities	0	0	0	0	0	0	#DIV/0!	9.0
Table D: Forest Health Maintenance Activities	1	1	1	1	1	1,000	1,000	8.7
Table E: Current Fire and Pest Activities	4	4	4	4	4	3,300	825	8.2
Table F: Habitat Supply Activities	640	506	466	266	265	447,000	698	5.4
Totals of all tables	9,012	9,508	9,093	8,808	7,791	3,299,212	423	

Activities Sorted by Priority (Ctl-e)

Management Unit	Table and category		Activity	Five-Year Plan Goals (ha) 2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Annual Plan 2000/01 Funding ($000)	Unit Cost ($)	Man. Unit Priority	Regional Priority
Tree Farm Licencees with Port McNeill	A	Backlog Legal	1 Planning/surveys/presc	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	3 Planting	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	4 Brushing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	5 Seed Purchase	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	6 Max. density spacing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Legal	7 Pruning	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	1 Planning/surveys/presc	#REF!	#REF!	#REF!	#REF!	#REF!	44,000	#REF!	2	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	2 Site preparation	#REF!	#REF!	#REF!	#REF!	#REF!	0	#REF!	4	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	3 Site Restoration Road/land	#REF!	#REF!	#REF!	#REF!	#REF!	0	#REF!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	4 Planting	#REF!	#REF!	#REF!	#REF!	#REF!	5,000	#REF!	3	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	5 Brushing	#REF!	#REF!	#REF!	#REF!	#REF!	90,000	#REF!	3	0
Tree Farm Licencees with Port McNeill	A	Backlog Backlog	6 Seed Purchase	5	5	0	0	0	350	70	4	0
Tree Farm Licencees with Port McNeill	A	Backlog Impeded	1 Planning/surveys/presc	2,312	1,600	1,450	1,450	450	93,512	40	3	0
Tree Farm Licencees with Port McNeill	A	Backlog Impeded	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Impeded	3 Planting	21	10	0	0	0	20,900	995	4	0
Tree Farm Licencees with Port McNeill	A	Backlog Impeded	4 Brushing	564	510	260	260	260	352,400	625	3	0
Tree Farm Licencees with Port McNeill	A	Backlog Impeded	5 Seed Purchase	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	A	Backlog Total	7 Studies	0	1	1	1	1	4,000	1,000,000	4	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	1 Planning/surveys/presc	1,130	2,790	2,790	2,765	2,780	91,450	81	1	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	2 Spacing	249	485	475	450	470	549,950	2,209	2	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	3 Pruning	116	350	350	350	350	295,800	2,550	6	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	4 Fertilizing	2,689	1,950	1,925	2,025	2,000	1,122,550	417	1	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	5 Studies	1	1	1	1	0	8,000	8,000	4	0
Tree Farm Licencees with Port McNeill	B	Stand Tending	6 Other	75	75	75	75	75	170,000	2,267	3	0
Tree Farm Licencees with Port McNeill	C	F. H. Enhancement	1 Site rehab	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	C	F. H. Enhancement	2 Spacing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	C	F. H. Enhancement	3 Pruning	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	C	F. H. Enhancement	4 Studies	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	C	F. H. Enhancement	5 Others	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	2 Aerial Surveys (hours flying	1	1	1	1	1	1,000	1,000	4	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	3 Fall & burn treatment (trees	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	D	F. H. Maintenance	8 Other	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	1 Planning/surveys/presc	2	2	2	2	2	300	150	4	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	3 Planting	2	2	2	2	2	3,000	1,500	4	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	E	Current Fire/Pest	7 Other	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	1 Planning/surveys/presc	440	320	320	120	120	47,000	107	2	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	3 Planting	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	4 Brushing	0	0	0	0	0	0	#DIV/0!	5	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	5 Spacing	100	120	80	80	80	200,000	2,000	3	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	6 Pruning	100	65	65	65	65	200,000	2,000	3	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	7 Studies	0	1	1	1	0	0	#DIV/0!	4	0
Tree Farm Licencees with Port McNeill	F	Habitat Supply	8 Others	0	0	0	0	0	0	#DIV/0!	5	0
										Check totals:		
Totals				#REF!	#REF!	#REF!	#REF!	#REF!	3,299,212	#REF!	239	

Appendix II

TFL 37

TFL 37 - Canadian Forest Products Ltd.
Summary Table
August 6, 1999

Table Totals

Table A: Backlog Activities
Table B: Stand Tending Activities
Table C: Forest Health Enhancement Activities
Table D: Forest Health Maintenance Activities
Table E: Current Fire and Pest Activities
Table F: Habitat Supply Activities
Totals of all tables

Five-Year Plan Goals (ha)					Annual Plan 2000/01		
2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
520	200	200	200	200	33,000	63	
1,095	0	0	0	0	415,500	379	
0	0	0	0	0	0	#DIV/0!	
0	0	0	0	0	0	#DIV/0!	
0	0	0	0	0	0	#DIV/0!	
400	240	240	240	240	425,000	1,063	
2,015	440	440	440	440	873,500	433	

Activities Sorted by Priority (Ctl-e)

Table and category		Activity		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
				2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority
A	Backlog Impeded	3	Planting	10	0	0	0	0	11,000	1,100	1
B	Stand Tending	4	Fertilizing	1,075	0	0	0	0	376,250	350	1
F	Habitat Supply	1	Planning/surveys/presc.	200	120	120	120	120	25,000	125	1
A	Backlog Impeded	4	Brushing	10	0	0	0	0	11,000	1,100	2
B	Stand Tending	1	Planning/surveys/presc.	10	0	0	0	0	1,250	125	2
B	Stand Tending	2	Spacing	10	0	0	0	0	38,000	3,800	2
F	Habitat Supply	5	Spacing	100	60	60	60	60	200,000	2,000	2
F	Habitat Supply	6	Pruning	100	60	60	60	60	200,000	2,000	2
A	Backlog Impeded	1	Planning/surveys/presc.	500	200	200	200	200	11,000	22	3
A	Backlog Total	7	Studies	0	0	0	0	0	0	0	9
C	F. H. Enhancement	1	Site rehab	0	0	0	0	0	0	0	9
C	F. H. Enhancement	2	Spacing	0	0	0	0	0	0	0	9
C	F. H. Enhancement	3	Pruning	0	0	0	0	0	0	0	9
C	F. H. Enhancement	4	Studies	0	0	0	0	0	0	0	9

Table Totals

			Five-Year Plan Goals (ha)					Annual Plan 2000/01		
			2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
C	F. H. Enhancement	5 Others	0	0	0	0	0	0	0	9
D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	2 Aerial Surveys (hours flying)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	3 Fall & burn treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	8 Other	0	0	0	0	0	0	0	9
E	Current Fire/Pest	1 Planning/surveys/presc.	0	0	0	0	0	0	0	9
E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	0	9
E	Current Fire/Pest	3 Planting	0	0	0	0	0	0	0	9
E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	0	9
E	Current Fire/Pest	7 Other	0	0	0	0	0	0	0	9
A	Backlog Legal	1 Planning/surveys/presc.	0	0	0	0	0	0	0	9
A	Backlog Legal	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Legal	3 Planting	0	0	0	0	0	0	0	9
A	Backlog Legal	4 Brushing	0	0	0	0	0	0	0	9
A	Backlog Legal	5 Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog Legal	6 Max. density spacing	0	0	0	0	0	0	0	9
A	Backlog Legal	7 Pruning	0	0	0	0	0	0	0	9
A	Backlog Backlog	1 Planning/surveys/presc.	0	0	0	0	0	0	0	9
A	Backlog Backlog	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Backlog	3 Site Restoration Road/land	0	0	0	0	0	0	0	9
A	Backlog Backlog	4 Planting	0	0	0	0	0	0	0	9
A	Backlog Backlog	5 Brushing	0	0	0	0	0	0	0	9
A	Backlog Backlog	6 Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog Impeded	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Impeded	5 Seed Purchase	0	0	0	0	0	0	0	9
B	Stand Tending	3 Pruning	0	0	0	0	0	0	0	9
B	Stand Tending	5 Studies	0	0	0	0	0	0	0	9
B	Stand Tending	6 Other	0	0	0	0	0	0	0	9
F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	0	9

Table Totals

		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
F Habitat Supply	3 Planting	0	0	0	0	0	0	0	9
F Habitat Supply	4 Brushing	0	0	0	0	0	0	0	9
F Habitat Supply	7 Studies	0	0	0	0	0	0	0	9
F Habitat Supply	8 Others	0	0	0	0	0	0	0	9
								Check totals:	
Totals		2,015	440	440	440	440	873,500	10,622	412

TFL 37 - Canadian Forest Products Ltd.
Table A: Backlog Activities
August 6, 1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
Legal Obligations	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0		9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Seed purchase	0	0	0	0	0	$0	0	9
6 Max. density spacing	0	0	0	0	0	$0	0	9
7 Pruning	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	0	#DIV/0!	
Backlog Reforestation								
1 Planning/surveys/prescriptions						$0		9
2 Site preparation						$0	0	9
3 Site restoration road/land. rehab						$0	0	9
4 Planting						$0		9
5 Brushing						$0		9
6 Seed purchase	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	
Impeded areas								
1 Planning/surveys/prescriptions	500	200	200	200	200	$11,000	$22	3
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	10	0	0	0	0	$11,000	1,100	1
4 Brushing	10	0	0	0	0	$11,000	1,100	2
5 Seed purchase	0	0	0	0	0	$0	0	9
Totals	520	200	200	200	200	$33,000	$63	
Backlog Activities - Management Unit Total								
1 Planning/surveys/prescriptions	500	200	200	200	200	$11,000	$22	
2 Site preparation	0	0	0	0	0	0	#DIV/0!	
3 Site restoration road/land. rehab	0	0	0	0	0	0	#DIV/0!	
4 Planting	10	0	0	0	0	11,000	1,100	
5 Brushing	10	0	0	0	0	11,000	1,100	
6 Seed purchase	0	0	0	0	0	0	#DIV/0!	
7 Max. density spacing	0	0	0	0	0	0	#DIV/0!	
8 Pruning	0	0	0	0	0	0	#DIV/0!	
9 Studies	0	0	0	0	0	0	0	9
Totals	520	200	200	200	200	$33,000	$63	

TFL 37 - Canadian Forest Products Ltd.
Table B: Stand Tending Activities
August 6, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01			
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority	
1 Planning/surveys/prescriptions	10	0	0	0	0	$1,250	$125	2	Community Forestry
2 Spacing	10	0	0	0	0	$38,000	3,800	2	Community Forestry
3 Pruning	0	0	0	0	0	$0	0	9	
4 Fertilizing	1075	0	0	0	0	$376,250	350	1	
5 Studies	0	0	0	0	0	$0	0	9	
6 Other	0	0	0	0	0	$0	0	9	
Totals	1095	0	0	0	0	415500	$379		

TFL 37 - Canadian Forest Products Ltd.
Table C: Forest Health Enhancement Activities
August 6, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Site rehab	0	0	0	0	0	$0	$0	9
2 Spacing	0	0	0	0	0	$0	0	9
3 Pruning	0	0	0	0	0	$0	0	9
4 Studies	0	0	0	0	0	$0	0	9
5 Others	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	

TFL 37 - Canadian Forest Products Ltd.
Table D: Forest Health Maintenance Activities
August 6, 1999

	Activities	Units	Five-year Plan Goals (ha)					Annual Plan 2000/01		
			2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1	Ground Surveys	ha	0	0	0	0	0	$0	$0	9
2	Aerial Surveys	hours of flying time	0	0	0	0	0	$0	0	9
3	Fall and burn treatment	trees	0	0	0	0	0	$0	0	9
4	MSMA treatment	trees	0	0	0	0	0	$0	0	9
5	Pheromone baiting	trees	0	0	0	0	0	$0	0	9
6	Defoliator spraying	ha	0	0	0	0	0	$0	0	9
7	Studies	number	0	0	0	0	0	$0	0	9
8	Other		0	0	0	0	0	$0	0	9
	Totals		0	0	0	0	0	$0	#DIV/0!	

TFL 37 - Canadian Forest Products Ltd.
Table E: Current Fire and Pest Activities
August 6, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Max. density spacing	0	0	0	0	0	$0	0	9
6 Studies	0	0	0	0	0	$0	0	9
7 Other	0	0	0	0	0	$0	0	9
Totals	$0	$0	$0	$0	$0	$0	#DIV/0!	

TFL 37 - Canadian Forest Products Ltd.
Table F: Habitat Supply Activities
August 6, 1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01			
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority	
1 Planning/surveys/prescriptions	200	120	120	120	120	$25,000	$125	1	
2 Site preparation	0	0	0	0	0	$0	0	9	
3 Planting	0	0	0	0	0	$0	0	9	
4 Brushing	0	0	0	0	0	$0	0	9	
5 Spacing	100	60	60	60	60	$200,000	2,000	2	First Nations Partners and Local Contractors
6 Pruning	100	60	60	60	60	$200,000	2,000	2	First Nations Partners and Local Contractors
7 Studies	0	0	0	0	0	$0	0	9	
8 Others	0	0	0	0	0	$0	0	9	
Totals	400	240	240	240	240	$425,000	$1,063		

Appendix III

TFL 45

TFL 45 Port McNeill District
Summary Table
August 17,1999

Table Totals	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
Table A: Backlog Activities	0	0	175	150	125	0	0	
Table B: Stand Tending Activities	0	135	100	50	0	0	#DIV/0!	
Table C: Forest Health Enhancement Activities	0	0	0	0	0	0	#DIV/0!	
Table D: Forest Health Maintenance Activities	0	0	0	0	0	0	#DIV/0!	
Table E: Current Fire and Pest Activities	0	0	0	0	0	0	#DIV/0!	
Table F: Habitat Supply Activities	0	0	0	0	0	0	#DIV/0!	
Totals of all tables	0	135	275	200	125	0	0	

Activities Sorted by Priority (Ctl-e)			Five-Year Plan Goals (ha)					Annual Plan 2000/01		
Table and category		Activity	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority
A Backlog Legal	1	Planning/surveys/presc.	0	0	0	0	0	0	0	0
A Backlog Legal	2	Site preparation	0	0	0	0	0	0	0	0
A Backlog Legal	3	Planting	0	0	0	0	0	0	0	0
A Backlog Legal	4	Brushing	0	0	0	0	0	0	0	0
A Backlog Legal	5	Seed Purchase	0	0	0	0	0	0	0	0
A Backlog Legal	6	Max. density spacing	0	0	0	0	0	0	0	0
A Backlog Legal	7	Pruning	0	0	0	0	0	0	0	0
A Backlog Backlog	1	Planning/surveys/presc.	0	0	100	100	100	0	0	0
A Backlog Backlog	2	Site preparation	0	0	0	0	0	0	0	0
A Backlog Backlog	3	Site Restoration Road/land.	0	0	0	0	0	0	0	0
A Backlog Backlog	4	Planting	0	0	0	0	0	0	0	0
A Backlog Backlog	5	Brushing	0	0	75	50	25	0	0	0
A Backlog Backlog	6	Seed Purchase	0	0	0	0	0	0	0	0
A Backlog Impeded	1	Planning/surveys/presc.	0	0	0	0	0	0	0	0

Table Totals

				Five-Year Plan Goals (ha)					Annual Plan 2000/01		
				2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
A	Backlog Impeded	2	Site preparation	0	0	0	0	0	0	0	0
A	Backlog Impeded	3	Planting	0	0	0	0	0	0	0	0
A	Backlog Impeded	4	Brushing	0	0	0	0	0	0	0	0
A	Backlog Impeded	5	Seed Purchase	0	0	0	0	0	0	0	0
A	Backlog Total	7	Studies	0	0	0	0	0	0	0	0
B	Stand Tending	1	Planning/surveys/presc.	0	50	50	25	0	0	0	0
B	Stand Tending	2	Spacing	0	35	25	0	0	0	0	0
B	Stand Tending	3	Pruning	0	0	0	0	0	0	0	0
B	Stand Tending	4	Fertilizing	0	50	25	25	0	0	0	0
B	Stand Tending	5	Studies	0	0	0	0	0	0	0	0
B	Stand Tending	6	Other	0	0	0	0	0	0	0	0
C	F. H. Enhancement	1	Site rehab	0	0	0	0	0	0	0	0
C	F. H. Enhancement	2	Spacing	0	0	0	0	0	0	0	0
C	F. H. Enhancement	3	Pruning	0	0	0	0	0	0	0	0
C	F. H. Enhancement	4	Studies	0	0	0	0	0	0	0	0
C	F. H. Enhancement	5	Others	0	0	0	0	0	0	0	0
D	F. H. Maintenance	1	Ground Surveys (ha)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	2	Aerial Surveys (hours flying)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	3	Fall & burn treatment (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	4	MSMA treatment (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	5	Pheromone baiting (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	6	Defoliator spraying (ha)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	7	Studies (number)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	8	Other	0	0	0	0	0	0	0	0
E	Current Fire/Pest	1	Planning/surveys/presc.	0	0	0	0	0	0	0	0
E	Current Fire/Pest	2	Site preparation	0	0	0	0	0	0	0	0
E	Current Fire/Pest	3	Planting	0	0	0	0	0	0	0	0
E	Current Fire/Pest	4	Brushing	0	0	0	0	0	0	0	0
E	Current Fire/Pest	5	Max. density spacing	0	0	0	0	0	0	0	0
E	Current Fire/Pest	6	Studies	0	0	0	0	0	0	0	0
E	Current Fire/Pest	7	Other	0	0	0	0	0	0	0	0
F	Habitat Supply	1	Planning/surveys/presc.	0	0	0	0	0	0	0	0
F	Habitat Supply	2	Site preparation	0	0	0	0	0	0	0	0
F	Habitat Supply	3	Planting	0	0	0	0	0	0	0	0
F	Habitat Supply	4	Brushing	0	0	0	0	0	0	0	0

Table Totals

		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
F Habitat Supply	5 Spacing	0	0	0	0	0	0	0	0
F Habitat Supply	6 Pruning	0	0	0	0	0	0	0	0
F Habitat Supply	7 Studies	0	0	0	0	0	0	0	0
F Habitat Supply	8 Others	0	0	0	0	0	0	0	0
							Check totals:		
Totals		0	135	275	200	125	0	0	0

TFL 45 Port McNeill District
Table A: Backlog Activities
August 17,1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
Legal Obligations	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Seed purchase	0	0	0	0	0	$0	0	0
6 Max. density spacing	0	0	0	0	0	$0	0	0
7 Pruning	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	0	#DIV/0!	
Backlog Reforestation								
1 Planning/surveys/prescriptions	0	0	100	100	100	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Site restoration road/land. rehab	0	0	0	0	0	$0	0	0
4 Planting	0	0	0	0	0	$0	0	0
5 Brushing	0	0	75	50	25	$0	0	0
6 Seed purchase	0	0	0	0	0	$0	0	0
Totals	0	0	175	150	125	$0	#DIV/0!	
Impeded areas								
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Seed purchase	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	$0	#DIV/0!	
Backlog Activities - Management Unit Total								
1 Planning/surveys/prescriptions	0	0	100	100	100	$0	#DIV/0!	
2 Site preparation	0	0	0	0	0	0	#DIV/0!	
3 Site restoration road/land. rehab	0	0	0	0	0	0	#DIV/0!	
4 Planting	0	0	0	0	0	0	#DIV/0!	
5 Brushing	0	0	75	50	25	0	#DIV/0!	
6 Seed purchase	0	0	0	0	0	0	#DIV/0!	
7 Max. density spacing	0	0	0	0	0	0	#DIV/0!	
8 Pruning	0	0	0	0	0	0	#DIV/0!	
9 Studies	0	0	0	0	0	0	0	0
Totals	0	0	175	150	125	$0	$0	

TFL 45 Port McNeill District
Table B: Stand Tending Activities
August 17,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	50	50	25	0	$0	$0	0
2 Spacing	0	35	25	0	0	$0	0	0
3 Pruning	0	0	0	0	0	$0	0	0
4 Fertilizing	0	50	25	25	0	$0	0	0
5 Studies	0	0	0	0	0	$0	0	0
6 Other	0	0	0	0	0	$0	0	0
Totals	0	135	100	50	0	0	#DIV/0!	

TFL 45 Port McNeill District
Table C: Forest Health Enhancement Activities
August 17,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Site rehab	0	0	0	0	0	$0	$0	0
2 Spacing	0	0	0	0	0	$0	0	0
3 Pruning	0	0	0	0	0	$0	0	0
4 Studies	0	0	0	0	0	$0	0	0
5 Others	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	$0	#DIV/0!	

TFL 45 Port McNeill District
Table D: Forest Health Maintenance Activities
August 17,1999

Activities	Units	Five-year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Ground Surveys	ha	0	0	0	0	0	$0	$0	0
2 Aerial Surveys	hours of flying time	0	0	0	0	0	$0	0	0
3 Fall and burn treatment	trees	0	0	0	0	0	$0	0	0
4 MSMA treatment	trees	0	0	0	0	0	$0	0	0
5 Pheromone baiting	trees	0	0	0	0	0	$0	0	0
6 Defoliator spraying	ha	0	0	0	0	0	$0	0	0
7 Studies	number	0	0	0	0	0	$0	0	0
8 Other		0	0	0	0	0	$0	0	0
Totals		0	0	0	0	0	$0	#DIV/0!	

TFL 45 Port McNeill District
Table E: Current Fire and Pest Activities
August 17,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Max. density spacing	0	0	0	0	0	$0	0	0
6 Studies	0	0	0	0	0	$0	0	0
7 Other	0	0	0	0	0	$0	0	0
Totals	$0	$0	$0	$0	$0	$0	#DIV/0!	

TFL 45 Port McNeill District
Table F: Habitat Supply Activities
August 17,1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Spacing	0	0	0	0	0	$0	0	0
6 Pruning	0	0	0	0	0	$0	0	0
7 Studies	0	0	0	0	0	$0	0	0
8 Others	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	$0	#DIV/0!	

Appendix IV

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MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Summary Table
Aug. 18, 1999

Table Totals

Table A: Backlog Activities
Table B: Stand Tending Activities
Table C: Forest Health Enhancement Activities
Table D: Forest Health Maintenance Activities
Table E: Current Fire and Pest Activities
Table F: Habitat Supply Activities
Totals of all tables

Five-Year Plan Goals (ha)					Annual Plan 2000/01		
2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1,105	1,105	1,105	1,005	1,005	135,000	122	
860	860	860	860	860	345,200	401	
0	0	0	0	0	0	#DIV/0!	
0	0	0	0	0	0	#DIV/0!	
0	0	0	0	0	0	#DIV/0!	
0	0	0	0	0	0	#DIV/0!	
1,965	1,965	1,965	1,865	1,865	480,200	244	

Activities Sorted by Priority (Ctl-e)

Table and category			Activity		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
					2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority
A	Backlog	Legal	1	Planning/surveys/presc.	0	0	0	0	0	0	0	9
A	Backlog	Legal	2	Site preparation	0	0	0	0	0	0	0	9
A	Backlog	Legal	3	Planting	0	0	0	0	0	0	0	9
A	Backlog	Legal	4	Brushing	0	0	0	0	0	0	0	9
A	Backlog	Legal	5	Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog	Legal	6	Max. density spacing	0	0	0	0	0	0	0	9
A	Backlog	Legal	7	Pruning	0	0	0	0	0	0	0	9
A	Backlog	Backlog	1	Planning/surveys/presc.	1,000	1,000	1,000	900	900	40,000	40	1
A	Backlog	Backlog	2	Site preparation	0	0	0	0	0	0	0	9
A	Backlog	Backlog	3	Site Restoration Road/land.	0	0	0	0	0	0	0	9
A	Backlog	Backlog	4	Planting	5	5	5	5	5	5,000	1,000	1
A	Backlog	Backlog	5	Brushing	100	100	100	100	100	90,000	900	1
A	Backlog	Backlog	6	Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog	Impeded	1	Planning/surveys/presc.	0	0	0	0	0	0	0	9

Table Totals

			Five-Year Plan Goals (ha)					Annual Plan 2000/01		
			2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
A	Backlog Impeded	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Impeded	3 Planting	0	0	0	0	0	0	0	9
A	Backlog Impeded	4 Brushing	0	0	0	0	0	0	0	9
A	Backlog Impeded	5 Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog Total	7 Studies	0	0	0	0	0	0	0	9
B	Stand Tending	1 Planning/surveys/presc.	400	400	400	400	400	13,200	33	1
B	Stand Tending	2 Spacing	40	40	40	40	40	72,000	1,800	2
B	Stand Tending	3 Pruning	0	0	0	0	0	0	0	9
B	Stand Tending	4 Fertilizing	400	400	400	400	400	200,000	500	1
B	Stand Tending	5 Studies	0	0	0	0	0	0	0	9
B	Stand Tending	6 Other	20	20	20	20	20	60,000	3,000	1
C	F. H. Enhancement	1 Site rehab	0	0	0	0	0	0	0	9
C	F. H. Enhancement	2 Spacing	0	0	0	0	0	0	0	9
C	F. H. Enhancement	3 Pruning	0	0	0	0	0	0	0	9
C	F. H. Enhancement	4 Studies	0	0	0	0	0	0	0	9
C	F. H. Enhancement	5 Others	0	0	0	0	0	0	0	9
D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	2 Aerial Surveys (hours flying)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	3 Fall & burn treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	8 Other	0	0	0	0	0	0	0	9
E	Current Fire/Pest	1 Planning/surveys/presc.	0	0	0	0	0	0	0	9
E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	0	9
E	Current Fire/Pest	3 Planting	0	0	0	0	0	0	0	9
E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	0	9
E	Current Fire/Pest	7 Other	0	0	0	0	0	0	0	9
F	Habitat Supply	1 Planning/surveys/presc.	0	0	0	0	0	0	0	9
F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	0	9
F	Habitat Supply	3 Planting	0	0	0	0	0	0	0	9
F	Habitat Supply	4 Brushing	0	0	0	0	0	0	0	9

Table Totals		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
		2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Priority
F Habitat Supply	5 Spacing	0	0	0	0	0	0	0	9
F Habitat Supply	6 Pruning	0	0	0	0	0	0	0	9
F Habitat Supply	7 Studies	0			0	0	0	0	9
F Habitat Supply	8 Others	0			0	0	0	0	9
								Check totals:	
Totals		1,965			1,865	1,865	480,200	7,273	422

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table A: Backlog Activities
Aug. 18, 1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
Legal Obligations	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Seed purchase	0	0	0	0	0	$0	0	9
6 Max. density spacing	0	0	0	0	0	$0	0	9
7 Pruning	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	0	#DIV/0!	
Backlog Reforestation								
1 Planning/surveys/prescriptions	1000	1000	1000	900	900	$40,000	$40	1
2 Site preparation	0	0	0	0	0	$0	0	9
3 Site restoration road/land. rehab	0	0	0	0	0	$0	0	9
4 Planting	5	5	5	5	5	$5,000	1,000	1
5 Brushing	100	100	100	100	100	$90,000	900	1
6 Seed purchase	0	0	0	0	0	$0	0	9
Totals	1105	1105	1105	1005	1005	$135,000	$122	
Impeded areas								
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Seed purchase	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	
Backlog Activities - Management Unit Total								
1 Planning/surveys/prescriptions	1000	1000	1000	900	900	$40,000	$40	
2 Site preparation	0	0	0	0	0	0	#DIV/0!	
3 Site restoration road/land. rehab	0	0	0	0	0	0	#DIV/0!	
4 Planting	5	5	5	5	5	5,000	1,000	
5 Brushing	100	100	100	100	100	90,000	900	
6 Seed purchase	0	0	0	0	0	0	#DIV/0!	
7 Max. density spacing	0	0	0	0	0	0	#DIV/0!	
8 Pruning	0	0	0	0	0	0	#DIV/0!	
9 Studies	0	0	0	0	0	0	0	9
Totals	1105	1105	1105	1005	1005	$135,000	$122	

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table B: Stand Tending Activities
Aug. 18, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	400	400	400	400	400	$13,200	$33	1
2 Spacing	40	40	40	40	40	$72,000	1,800	2
3 Pruning	0	0	0	0	0	$0	0	9
4 Fertilizing	400	400	400	400	400	$200,000	500	1
5 Studies	0	0	0	0	0	$0	0	9
6 Other	20	20	20	20	20	$60,000	3,000	1
Totals	860	860	860	860	860	345200	$401	

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table C: Forest Health Enhancement Activities
Aug. 18, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Site rehab	0	0	0	0	0	$0	$0	9
2 Spacing	0	0	0	0	0	$0	0	9
3 Pruning	0	0	0	0	0	$0	0	9
4 Studies	0	0	0	0	0	$0	0	9
5 Others	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table D: Forest Health Maintenance Activities
Aug. 18, 1999

	Activities	Units	Five-year Plan Goals (ha)					Annual Plan 2000/01		
			2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1	Ground Surveys	ha	0	0	0	0	0	$0	$0	9
2	Aerial Surveys	hours of flying time	0	0	0	0	0	$0	0	9
3	Fall and burn treatment	trees	0	0	0	0	0	$0	0	9
4	MSMA treatment	trees	0	0	0	0	0	$0	0	9
5	Pheromone baiting	trees	0	0	0	0	0	$0	0	9
6	Defoliator spraying	ha	0	0	0	0	0	$0	0	9
7	Studies	number	0	0	0	0	0	$0	0	9
8	Other		0	0	0	0	0	$0	0	9
	Totals		0	0	0	0	0	$0	#DIV/0!	

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table E: Current Fire and Pest Activities
Aug. 18, 1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Max. density spacing	0	0	0	0	0	$0	0	9
6 Studies	0	0	0	0	0	$0	0	9
7 Other	0	0	0	0	0	$0	0	9
Totals	$0	$0	$0	$0	$0	$0	#DIV/0!	

MacMillan Bloedel Ltd., Port McNeill District, FRBC Sustainable Harvest
Table F: Habitat Supply Activities
Aug. 18, 1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Spacing	0	0	0	0	0	$0	0	9
6 Pruning	0	0	0	0	0	$0	0	9
7 Studies	0	0	0	0	0	$0	0	9
8 Others	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	

Appendix V

TFL 47

TFL 47; Port McNeill Forest District
Summary Table
August 7,1999

	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
Table Totals								
Table A: Backlog Activities	1,015	1,031	1,026	1,016	16	59,350	58	
Table B: Stand Tending Activities	326	216	216	316	375	252,000	773	
Table C: Forest Health Enhancement Activities	0	0	0	0	0	0	#DIV/0!	
Table D: Forest Health Maintenance Activities	1	1	1	1	1	1,000	1,000	
Table E: Current Fire and Pest Activities	4	4	4	4	4	3,300	825	
Table F: Habitat Supply Activities	200	226	226	26	25	16,000	80	
Totals of all tables	1,546	1,478	1,473	1,363	421	331,650	215	

Activities Sorted by Priority (Ctl-e)			Five-Year Plan Goals (ha)					Annual Plan 2000/01		
Table and category		Activity	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority
A	Backlog Legal	1 Planning/surveys/presc	0	0	0	0	0	0	0	9
A	Backlog Legal	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Legal	3 Planting	0	0	0	0	0	0	0	9
A	Backlog Legal	4 Brushing	0	0	0	0	0	0	0	9
A	Backlog Legal	5 Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog Legal	6 Max. density spacing	0	0	0	0	0	0	0	9
A	Backlog Legal	7 Pruning	0	0	0	0	0	0	0	9
A	Backlog Backlog	1 Planning/surveys/presc	100	100	0	0	0	4,000	40	2
A	Backlog Backlog	2 Site preparation	0	5	5	0	0	0	1,200	3
A	Backlog Backlog	3 Site Restoration Road/land	0	0	0	0	0	0	0	9
A	Backlog Backlog	4 Planting	0	5	5	0	0	0	1,000	3
A	Backlog Backlog	5 Brushing	0	5	5	5	5	0	800	3
A	Backlog Backlog	6 Seed Purchase	5	5	0	0	0	350	70	3
A	Backlog Impeded	1 Planning/surveys/presc	900	900	1,000	1,000	0	36,000	40	2
A	Backlog Impeded	2 Site preparation	0	0	0	0	0	0	0	9
A	Backlog Impeded	3 Planting	0	0	0	0	0	0	0	9
A	Backlog Impeded	4 Brushing	10	10	10	10	10	15,000	1,500	2
A	Backlog Impeded	5 Seed Purchase	0	0	0	0	0	0	0	9
A	Backlog Total	7 Studies	0	1	1	1	1	4,000	#DIV/0!	3
B	Stand Tending	1 Planning/surveys/presc	200	120	120	120	160	12,000	60	2
B	Stand Tending	2 Spacing	90	60	60	60	80	162,000	1,800	3
B	Stand Tending	3 Pruning	0	0	0	0	0	0	0	9
B	Stand Tending	4 Fertilizing	0	0	0	100	100	0	250	3
B	Stand Tending	5 Studies	1	1	1	1	0	8,000	8,000	3
B	Stand Tending	6 Other	35	35	35	35	35	70,000	2,000	3
C	F. H. Enhancement	1 Site rehab	0	0	0	0	0	0	0	9
C	F. H. Enhancement	2 Spacing	0	0	0	0	0	0	0	9
C	F. H. Enhancement	3 Pruning	0	0	0	0	0	0	0	9
C	F. H. Enhancement	4 Studies	0	0	0	0	0	0	0	9
C	F. H. Enhancement	5 Others	0	0	0	0	0	0	0	9
D	F. H. Maintenance	1 Ground Surveys (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	2 Aerial Surveys (hours flying)	1	1	1	1	1	1,000	1,000	1
D	F. H. Maintenance	3 Fall & burn treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	4 MSMA treatment (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	5 Pheromone baiting (trees)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	6 Defoliator spraying (ha)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	7 Studies (number)	0	0	0	0	0	0	0	9
D	F. H. Maintenance	8 Other	0	0	0	0	0	0	0	9
E	Current Fire/Pest	1 Planning/surveys/presc	2	2	2	2	2	300	150	1
E	Current Fire/Pest	2 Site preparation	0	0	0	0	0	0	0	9
E	Current Fire/Pest	3 Planting	2	2	2	2	2	3,000	1,500	1
E	Current Fire/Pest	4 Brushing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	5 Max. density spacing	0	0	0	0	0	0	0	9
E	Current Fire/Pest	6 Studies	0	0	0	0	0	0	0	9
E	Current Fire/Pest	7 Other	0	0	0	0	0	0	0	9
F	Habitat Supply	1 Planning/surveys/presc	200	200	200	0	0	16,000	80	1
F	Habitat Supply	2 Site preparation	0	0	0	0	0	0	0	9
F	Habitat Supply	3 Planting	0	0	0	0	0	0	0	9
	Habitat Supply	4 Brushing	0	0	0	0	0	0	0	9
	Habitat Supply	5 Spacing	0	20	20	20	20	0	1,800	3
	Habitat Supply	6 Pruning	0	5	5	5	5	0	1,500	3
	Habitat Supply	7 Studies	0	1	1	1	0	0	8,000	3
	Habitat Supply	8 Others	0	0	0	0	0	0	0	9
									Check totals	
Totals			1,546	1,478	1,473	1,363	421	331,650	#DIV/0!	345

TFL 47; Port McNeill Forest District
Table A: Backlog Activities
August 7,1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
Legal Obligations	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	9
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Seed purchase	0	0	0	0	0	$0	0	9
6 Max. density spacing	0	0	0	0	0	$0	0	9
7 Pruning	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	0	#DIV/0!	
Backlog Reforestation								
1 Planning/surveys/prescriptions	100	100	0	0	0	$4,000	$40	2
2 Site preparation	0	5	5	0	0	$0	1,200	3
3 Site restoration road/land. rehab	0	0	0	0	0	$0	0	9
4 Planting	0	5	5	0	0	$0	1,000	3
5 Brushing	0	5	5	5	5	$0	800	3
6 Seed purchase	5	5	0	0	0	$350	70	3
Totals	105	120	15	5	5	$4,350	$41	
Impeded areas								
1 Planning/surveys/prescriptions	900	900	1000	1000	0	$36,000	$40	2
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	10	10	10	10	10	$15,000	1,500	2
5 Seed purchase	0	0	0	0	0	$0	0	9
Totals	910	910	1010	1010	10	$51,000	$56	
Backlog Activities - Management Unit Total								
1 Planning/surveys/prescriptions	1000	1000	1000	1000	0	$40,000	$40	
2 Site preparation	0	5	5	0	0	0	#DIV/0!	
3 Site restoration road/land. rehab	0	0	0	0	0	0	#DIV/0!	
4 Planting	0	5	5	0	0	0	#DIV/0!	
5 Brushing	10	15	15	15	15	15,000	1,500	
6 Seed purchase	5	5	0	0	0	350	70	
7 Max. density spacing	0	0	0	0	0	0	#DIV/0!	
8 Pruning	0	0	0	0	0	0	#DIV/0!	
9 Studies		1	1	1	1	4,000	#DIV/0!	3
Totals	1015	1031	1026	1016	16	$59,350	$58	

TFL 47; Port McNeill Forest District
Table B: Stand Tending Activities
August 7,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	200	120	120	120	160	$12,000	$60	2
2 Spacing	90	60	60	60	80	$162,000	1,800	3
3 Pruning	0	0	0	0	0	$0	0	9
4 Fertilizing	0	0	0	100	100	$0	250	3
5 Studies	1	1	1	1	0	$8,000	8,000	3
6 Other	35	35	35	35	35	$70,000	2,000	3
Totals	326	216	216	316	375	252000	$773	

TFL 47; Port McNeill Forest District
Table C: Forest Health Enhancement Activities
August 7,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Site rehab	0	0	0	0	0	$0	$0	9
2 Spacing	0	0	0	0	0	$0	0	9
3 Pruning	0	0	0	0	0	$0	0	9
4 Studies	0	0	0	0	0	$0	0	9
5 Others	0	0	0	0	0	$0	0	9
Totals	0	0	0	0	0	$0	#DIV/0!	

TFL 47; Port McNeill Forest District
Table D: Forest Health Maintenance Activities
August 7,1999

Activities	Units	Five-year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Ground Surveys	ha	0	0	0	0	0	$0	$0	9
2 Aerial Surveys	flying time	1	1	1	1	1	$1,000	1,000	1
3 Fall and burn treatment	trees	0	0	0	0	0	$0	0	9
4 MSMA treatment	trees	0	0	0	0	0	$0	0	9
5 Pheromone baiting	trees	0	0	0	0	0	$0	0	9
6 Defoliator spraying	ha	0	0	0	0	0	$0	0	9
7 Studies	number	0	0	0	0	0	$0	0	9
8 Other		0	0	0	0	0	$0	0	9
Totals		1	1	1	1	1	$1,000	$1,000	

TFL 47; Port McNeill Forest District
Table E: Current Fire and Pest Activities
August 7,1999

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	2	2	2	2	2	$300	$150	1
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	2	2	2	2	2	$3,000	1,500	1
4 Brushing	0	0	0	0	0	$0	0	9
5 Max. density spacing	0	0	0	0	0	$0	0	9
6 Studies	0	0	0	0	0	$0	0	9
7 Other	0	0	0	0	0	$0	0	9
Totals	$4	$4	$4	$4	$4	$3,300	$825	

TFL 47; Port McNeill Forest District
Table F: Habitat Supply Activities
August 7,1999

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	200	200	200	0	0	$16,000	$80	1
2 Site preparation	0	0	0	0	0	$0	0	9
3 Planting	0	0	0	0	0	$0	0	9
4 Brushing	0	0	0	0	0	$0	0	9
5 Spacing	0	20	20	20	20	$0	1,800	3
6 Pruning	0	5	5	5	5	$0	1,500	3
7 Studies	0	1	1	1	0	$0	8,000	3
8 Others	0	0	0	0	0	$0	0	9
Totals	200	226	226	26	25	$16,000	$80	

Appendix VI

TFL 6

TFL 6, Western Forest Products
Summary Table
36383

Table Totals	Five-Year Plan Goals (ha)					Annual Plan 2000/01		
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Priority
Table A: Backlog Activities	1,467	1,010	500	500	500	382,812	261	
Table B: Stand Tending Activities	1,979	4,440	4,440	4,440	4,440	1,225,050	619	
Table C: Forest Health Enhancement Activities	0	0	0	0	0	0	#DIV/0!	
Table D: Forest Health Maintenance Activities	0	0	0	0	0	0	#DIV/0!	
Table E: Current Fire and Pest Activities	0	0	0	0	0	0	#DIV/0!	
Table F: Habitat Supply Activities	40	40	0	0	0	6,000	150	
Totals of all tables	3,486	5,490	4,940	4,940	4,940	1,613,862	463	

Activities Sorted by Priority (Ctl-e)				Five-Year Plan Goals (ha)					Annual Plan 2000/01		
Table and category			Activity	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	Funding ($000)	Unit Cost ($)	Man. Unit Priority
A	Backlog	Legal	1 Planning/surveys/presc.	0	0	0	0	0	0	0	0
A	Backlog	Legal	2 Site preparation	0	0	0	0	0	0	0	0
A	Backlog	Legal	3 Planting	0	0	0	0	0	0	0	0
A	Backlog	Legal	4 Brushing	0	0	0	0	0	0	0	0
A	Backlog	Legal	5 Seed Purchase	0	0	0	0	0	0	0	0
A	Backlog	Legal	6 Max. density spacing	0	0	0	0	0	0	0	0
A	Backlog	Legal	7 Pruning	0	0	0	0	0	0	0	0
A	Backlog	Backlog	1 Planning/surveys/presc.	0	0	0	0	0	0	0	0
A	Backlog	Backlog	2 Site preparation	0	0	0	0	0	0	0	0
A	Backlog	Backlog	3 Site Restoration Road/land.	0	0	0	0	0	0	0	0
A	Backlog	Backlog	4 Planting	0	0	0	0	0	0	0	0
A	Backlog	Backlog	5 Brushing	0	0	0	0	0	0	0	0
A	Backlog	Backlog	6 Seed Purchase	0	0	0	0	0	0	0	0
A	Backlog	Impeded	1 Planning/surveys/presc.	912	500	250	250	250	46,512	51	1

Table Totals

				Five-Year Plan Goals (ha)					Annual Plan 2000/01		
				2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
A	Backlog Impeded	2	Site preparation	0	0	0	0	0	0	0	0
A	Backlog Impeded	3	Planting	11	10	0	0	0	9,900	900	1
A	Backlog Impeded	4	Brushing	544	500	250	250	250	326,400	600	1
A	Backlog Impeded	5	Seed Purchase	0	0	0	0	0	0	0	0
A	Backlog Total	7	Studies	0	0	0	0	0	0	0	0
B	Stand Tending	1	Planning/surveys/presc.	520	2,220	2,220	2,220	2,220	65,000	125	1
B	Stand Tending	2	Spacing	109	350	350	350	350	277,950	2,550	3
B	Stand Tending	3	Pruning	116	350	350	350	350	295,800	2,550	3
B	Stand Tending	4	Fertilizing	1,214	1,500	1,500	1,500	1,500	546,300	450	1
B	Stand Tending	5	Studies	0	0	0	0	0	0	0	0
B	Stand Tending	6	Other	20	20	20	20	20	40,000	2,000	3
C	F. H. Enhancement	1	Site rehab	0	0	0	0	0	0	0	0
C	F. H. Enhancement	2	Spacing	0	0	0	0	0	0	0	0
C	F. H. Enhancement	3	Pruning	0	0	0	0	0	0	0	0
C	F. H. Enhancement	4	Studies	0	0	0	0	0	0	0	0
C	F. H. Enhancement	5	Others	0	0	0	0	0	0	0	0
D	F. H. Maintenance	1	Ground Surveys (ha)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	2	Aerial Surveys (hours flying)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	3	Fall & burn treatment (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	4	MSMA treatment (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	5	Pheromone baiting (trees)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	6	Defoliator spraying (ha)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	7	Studies (numbe)	0	0	0	0	0	0	0	0
D	F. H. Maintenance	8	Other	0	0	0	0	0	0	0	0
E	Current Fire/Pest	1	Planning/surveys/presc.	0	0	0	0	0	0	0	0
E	Current Fire/Pest	2	Site preparation	0	0	0	0	0	0	0	0
E	Current Fire/Pest	3	Planting	0	0	0	0	0	0	0	0
E	Current Fire/Pest	4	Brushing	0	0	0	0	0	0	0	0
E	Current Fire/Pest	5	Max. density spacing	0	0	0	0	0	0	0	0
E	Current Fire/Pest	6	Studies	0	0	0	0	0	0	0	0
E	Current Fire/Pest	7	Other	0	0	0	0	0	0	0	0
F	Habitat Supply	1	Planning/surveys/presc.	40	0	0	0	0	6,000	150	1
F	Habitat Supply	2	Site preparation	0	0	0	0	0	0	0	0
F	Habitat Supply	3	Planting	0	0	0	0	0	0	0	0
F	Habitat Supply	4	Brushing	0	0	0	0	0	0	0	0

Table Totals

		Five-Year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
F Habitat Supply	5 Spacing	0	40	0	0	0	0	2,550	3
F Habitat Supply	6 Pruning	0	0	0	0	0	0	0	0
F Habitat Supply	7 Studies	0	0	0	0	0	0	0	0
F Habitat Supply	8 Others	0	0	0	0	0	0	0	0
								Check totals:	
Totals		3,486	5,490	4,940	4,940	4,940	1,613,862	11,926	18

TFL 6, Western Forest Products
Table A: Backlog Activities
36383

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
Legal Obligations	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Seed purchase	0	0	0	0	0	$0	0	0
6 Max. density spacing	0	0	0	0	0	$0	0	0
7 Pruning	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	0	#DIV/0!	
Backlog Reforestation								
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Site restoration road/land. rehab	0	0	0	0	0	$0	0	0
4 Planting	0	0	0	0	0	$0	0	0
5 Brushing	0	0	0	0	0	$0	0	0
6 Seed purchase	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	$0	#DIV/0!	
Impeded areas								
1 Planning/surveys/prescriptions	912	500	250	250	250	$46,512	$51	1
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	11	10	0	0	0	$9,900	900	1
4 Brushing	544	500	250	250	250	$326,400	600	1
5 Seed purchase	0	0	0	0	0	$0	0	0
Totals	1467	1010	500	500	500	$382,812	$261	
Backlog Activities - Management Unit Total								
1 Planning/surveys/prescriptions	912	500	250	250	250	$46,512	$51	
2 Site preparation	0	0	0	0	0	0	#DIV/0!	
3 Site restoration road/land. rehab	0	0	0	0	0	0	#DIV/0!	
4 Planting	11	10	0	0	0	9,900	900	
5 Brushing	544	500	250	250	250	326,400	600	
6 Seed purchase	0	0	0	0	0	0	#DIV/0!	
7 Max. density spacing	0	0	0	0	0	0	#DIV/0!	
8 Pruning	0	0	0	0	0	0	#DIV/0!	
9 Studies	0	0	0	0	0	0	0	0
Totals	1467	1010	500	500	500	$382,812	$261	

TFL 6, Western Forest Products
Table B: Stand Tending Activities
36383

	Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1	Planning/surveys/prescriptions	520	2220	2220	2220	2220	$65,000	$125	1
2	Spacing	109	350	350	350	350	$277,950	2,550	3
3	Pruning	116	350	350	350	350	$295,800	2,550	3
4	Fertilizing	1214	1500	1500	1500	1500	$546,300	450	1
5	Studies	0	0	0	0	0	$0	0	0
6	Other	20	20	20	20	20	$40,000	2,000	3
	Totals	1979	4440	4440	4440	4440	1225050	$619	

8/9/2005

TFL 6, Western Forest Products
Table C: Forest Health Enhancement Activities
36383

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Site rehab	0	0	0	0	0	$0	$0	0
2 Spacing	0	0	0	0	0	$0	0	0
3 Pruning	0	0	0	0	0	$0	0	0
4 Studies	0	0	0	0	0	$0	0	0
5 Others	0	0	0	0	0	$0	0	0
Totals	0	0	0	0	0	$0	#DIV/0!	

TFL 6, Western Forest Products
Table D: Forest Health Maintenance Activities
36383

	Activities	Units	Five-year Plan Goals (ha)					Annual Plan 2000/01		
			2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1	Ground Surveys	ha	0	0	0	0	0	$0	$0	0
2	Aerial Surveys	hours of flying time	0	0	0	0	0	$0	0	0
3	Fall and burn treatment	trees	0	0	0	0	0	$0	0	0
4	MSMA treatment	trees	0	0	0	0	0	$0	0	0
5	Pheromone baiting	trees	0	0	0	0	0	$0	0	0
6	Defoliator spraying	ha	0	0	0	0	0	$0	0	0
7	Studies	number	0	0	0	0	0	$0	0	0
8	Other		0	0	0	0	0	$0	0	0
	Totals		0	0	0	0	0	$0	#DIV/0!	

TFL 6, Western Forest Products
Table E: Current Fire and Pest Activities
36383

Activities	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	$0	0
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Max. density spacing	0	0	0	0	0	$0	0	0
6 Studies	0	0	0	0	0	$0	0	0
7 Other	0	0	0	0	0	$0	0	0
Totals	$0	$0	$0	$0	$0	$0	#DIV/0!	

TFL 6, Western Forest Products
Table F: Habitat Supply Activities
36383

	Five-year Plan Goals (ha)					Annual Plan 2000/01		
	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	Funding ($000)	Unit Cost ($)	Priority
1 Planning/surveys/prescriptions	40	0	0	0	0	$6,000	$150	1
2 Site preparation	0	0	0	0	0	$0	0	0
3 Planting	0	0	0	0	0	$0	0	0
4 Brushing	0	0	0	0	0	$0	0	0
5 Spacing	0	40	0	0	0	$0	2,550	3
6 Pruning	0	0	0	0	0	$0	0	0
7 Studies	0	0	0	0	0	$0	0	0
8 Others	0	0	0	0	0	$0	0	0
Totals	40	40	0	0	0	$6,000	$150	